Guideline

Rural Paediatric Emergency Clinical Guidelines - Third Edition

Summary The Guideline is designed to improve emergency care and outcomes for patients in the rural and remote health care settings of NSW by providing best practice guidance, and to support the role that many Registered Nurses currently perform in rural and remote settings.

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Distributed to Public Health System, Divisions of General Practice, NSW Ambulance Service, Private Hospitals and Day Procedure Centres

Audience Rural Emergency Department Nursing and Medical Staff

RURAL PAEDIATRIC EMERGENCY CLINICAL GUIDELINES - THIRD EDITION

GUIDELINE SUMMARY

The Guideline provides First Line Emergency Care Course (FLECC) trained nurses with best practice guidance for early management of acute and life-threatening conditions. It is relevant to rural and remote paediatric inpatient areas.

The Guideline aligns with the NSW “Between the Flags” program and facilitates management in the absence of immediate access to a medical officer. It improves overall care and outcomes for infants and children in rural and remote hospitals by allowing treatment to be commenced immediately.

KEY PRINCIPLES

The Guideline is designed to:

- improve emergency care and outcomes for patients in the rural and remote health care settings of NSW
- assist rural and remote Emergency Departments (EDs) in NSW achieve benchmarking targets and best practice standards for patients presenting to emergency
- provide best practice guidance, and to support the role that many Registered Nurses currently perform in rural and remote settings.

In circumstances where a patient meets more than one guideline, the most life-threatening condition should take priority and the most appropriate corresponding guideline commenced.

USE OF THE GUIDELINE

Directors of Clinical Governance are required to inform relevant clinical staff treating paediatric patients of the revised Guideline. Implementation should occur in conjunction with the local Clinical Emergency Response System (CERS) and continuing professional development.

Chief Executives must ensure that:

- the Guideline is adopted or that local protocols are in place in all hospitals and facilities likely to be required to provide emergency treatment to infants and children
- emergency nurses have the opportunity to access the First Line Emergency Care Course (FLECC).

FLECC-trained nurses must ensure that:

- a designated medical officer is notified as soon as practicable

FLECC-trained nurses and medical officers must ensure that:

- medication standing orders contained and used in the Guideline are reviewed and authorised by the designated medical officer as soon as possible (within 24 hours) and;
- the medical officer countersigns the record of administration on the patients' medication chart

Enrolled nurses and registered nurses who are not FLECC credentialed using the guideline to inform assessment and management, are not to undertake shaded interventions that require FLECC credentialing unless previous recognition of prior learning has been granted.

REVISION HISTORY

Version	Approved by	Amendment notes
July-2021 (GL2021_011)	Chief Executive, Agency for Clinical Innovation	• Correction of typographical error in Appendix Five: Choking Child Algorithm • Laceraine Gel replaces Laceraine solution
July-2020 (GL2020_016)	Executive Director, Health and Social Policy Branch	Minor edits undertaken: • page 48 Vancomycin standing order changed to 25mg/kg to reflect recommended dose in the document • pages 26, 27 and 69 Midazolam maximum dose updated to 5mg.
May-2020 (GL2020_010)	Deputy Secretary, Health System Strategy and Planning	Guideline updated to align with: • GL2015_008 Standards for Paediatric Intravenous Fluids, Second Edition • Paediatric Sepsis Pathway developed by the Clinical Excellence Commission • Australian Asthma Handbook • Australian Medicines Handbook: Children's Dosing Companion, and • The Therapeutic Guidelines.
May-2014 (GL2014_007)	Deputy Secretary, Population and Public Health	Guideline updated to align with: • Parameters of Standard Paediatric Observation Chart (SPOC) • Paediatric Clinical Practice Guidelines- particularly Recognition of the Sick Baby and Child; • DETECT Junior; • Paediatric Sepsis Pathway and • Clinical Escalation and Response Systems.
July-2011 (PD2011_047)	Deputy Director General, Population and Public Health and Chief Health Officer	New Guideline

ATTACHMENTS

1. Rural Paediatric Emergency Clinical Guidelines - Third Edition

NSW Rural Paediatric Emergency Clinical Guidelines

Third Edition

NSW GOVERNMENT

2021

ACKNOWLEDGEMENT

These Guidelines were originally developed by the NSW Children's Healthcare Network Paediatric Clinical Nurse Consultant Group in consultation with the NSW Rural Critical Care Task Force, NSW Rural Critical Care CNC Planning Group, the Clinical Excellence Commission, and Statewide Services Development Branch. There has been significant direction and contribution by the specialist clinicians in the field. The considerable effort of all involved, particularly the Paediatric Clinical Nurse Consultant Group as subject matter experts is acknowledged.

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The *NSW Rural Paediatric Emergency Clinical Guidelines* are to be implemented for the emergency management of paediatric patients only (one month to 16 years)

Clinical escalation for children

Step 1 Contact the most senior available expertise within the local facility

Step 2 Contact the paediatrician on-call for the region

Step 3 Contact Newborn and paediatric Emergency Transport Service (NETS) 1300 36 2500

(PD2013_049)

The *NSW Rural Paediatric Emergency Clinical Guidelines* are aligned with NSW Health's Standard Paediatric Observation Charts, Clinical Emergency Response System (CERS), paediatric clinical practice guidelines, RESUS4Kids, DETECT Junior and the Paediatric Sepsis Pathway

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Section 1
Introduction

Emergency Departments (EDs) in rural and remote NSW face a number of unique and difficult challenges in delivering quality emergency care and achieving good patient outcomes. In particular, it can be difficult for staff working in rural and remote EDs to acquire and retain emergency expertise. This may lead to variability in the standard of emergency care delivered in rural and remote EDs.

A key function of the Children's Healthcare Network (CHN) Paediatric Clinical Nurse Consultants is to identify and develop ways to ensure a more uniform approach to the delivery of paediatric emergency care in rural and remote EDs. In 2010, the Clinical Nurse Consultants coordinated development of a set of rural emergency clinical paediatric guidelines. The guidelines were for use by rural and remote Registered Nurses (RNs), who had completed approved education and credentialing, as required by the First Line Emergency Care Course (FLECC).

1.1 Use of this Guideline

The intention of this Guideline is to ensure early assessment and management of immediately or imminently life threatening conditions, and to relieve pain and suffering in children at sites where Medical Officers (MO) are not onsite 24 hours a day, or not immediately available.

This Guideline is designed to:

- Improve emergency care and outcomes for patients in the rural and remote health care settings of NSW.
- Provide readily accessible and user-friendly guidelines for clinicians providing emergency care to patients in rural and remote areas of NSW.
- Assist rural and remote EDs in NSW achieve benchmarking targets and best practice standards for patients presenting to emergency.
- Address some of the current professional issues facing rural and remote RNs by:
  - Articulating a framework to support rural and remote RNs to initiate management and care of emergency patients.
  - Recognising and formalising the role that many rural and remote RNs currently perform when delivering care to critically ill or injured patients presenting to EDs.
  - Providing a pathway by which credentialed RNs can work toward continuing professional development.

1.2 Use outside of the ED

Whilst originally developed to ensure a high level of quality care within rural EDs, the Guideline can be implemented in any inpatient area where an MO is not immediately available such as a ward environment, as long as they are used by a Paediatric FLECC credentialed nurse. This Guideline may also be implemented by the Paediatric FLECC credentialed nurse in the absence of immediate access to an MO, for patients who fall into the 'Clinical Review' or 'Rapid Response' criteria of the NSW "Between the Flags" program.

Implementation should occur in conjunction with activation of the local Clinical Emergency Response System (CERS). The Paediatric FLECC credentialed nurse should be familiar with the local CERS protocol.

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses.

1.3 Format and content of the Guideline

This review of the Guideline is in line with changes to best practice, and requests and advice from rural and remote nurses. The Guideline has been developed with the following features.

- Incorporation of the various legal requirements for nurses who initiate treatment and administer medications based on medication standing orders.
- Guideline is flexible enough to allow local input from rural MOs and RNs so that local practices can be incorporated.
- Endorsement by the NSW Ministry of Health.
- Standardisation of the management of specific paediatric conditions across rural NSW at sites using this Guideline.
- Formatting which allows for 'graduated' clinical responses. These responses vary depending on:
  - The degree of severity of the presenting emergency condition. For example, the clinical response to patients with mild to moderately severe asthma is different to that for patients with immediately life threatening asthma. This type of graduated clinical response has been used quite successfully in ambulance service protocols for many years.
  - The level of training and expertise of the nursing staff who are initiating management of the patient – that is, formatting which allows Paediatric FLECC credentialed nurses to initiate interventions as indicated. RN's without this FLECC training and credentialing cannot perform the shaded interventions.

  The use of shaded portions in the NSW Rural Paediatric Emergency Clinical Guidelines indicates clinical interventions that can only be initiated by RNs who are recognised as Paediatric FLECC credentialed nurses.

The Guideline is formatted to follow the generally accepted Airway, Breathing, Circulation (ABC) approach for managing emergency/critical care patients and should be used in conjunction with the NSW Ministry of Health Standard Paediatric Observation Charts.

Other than resuscitation algorithms, these guidelines are not for use in infants less than four weeks of age due to significant pharmacological and physiological differences. Newborn and paediatric Emergency Transport Service (NETS) or the regional paediatrician should be called early in this age group.

A number of appendices have been included to complement this Guideline. Staff should familiarise themselves with the Appendices and Formulary.

1.4 Nurse scope of practice

Nursing staff using this Guideline are required to be appropriately qualified, skilled and credentialed. The shaded portions contained in the treatment guidelines must only be used by RNs who are recognised as Paediatric FLECC credentialed nurses. Paediatric FLECC credentialed nurses are RNs that have the necessary knowledge and skills and have been deemed competent to carry out this role using contemporary assessment and ongoing credentialing processes if:

- they have successfully completed an advanced emergency or critical care nursing course such as the First Line Emergency Care Course (FLECC), OR Graduate Certificate/Graduate Diploma in Paediatric Nursing – Emergency stream or equivalent, and
- they can demonstrate recent and ongoing knowledge and experience with managing emergency/critical care paediatric patients, and
- they can demonstrate completion of identified pre-requisite learning as outlined by the NSW Children's Healthcare Network and Local Health Districts (LHD).

Credentialing will be obtained and maintained by:

- completion of competency assessments as recommended by the Children's Healthcare Network regions in each LHD
- the nurse maintaining appropriate documentation to allow review of the usage of the Guideline.

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Paediatric FLECC credentialed nurses are required to be re-credentialed at least every two years, or at the discretion of the LHD paediatric FLECC course coordinator. It is the responsibility of the rural LHDs through their CHN region, Critical Care Network Committee and Health Service Managers to ensure compliance with these requirements.

1.5 Implementation and clinical documentation

This Guideline and respective medication standing orders must be considered by individual LHD drug and therapeutic committees for approval and implementation. Medications and/or interventions outlined in the Guideline can only be initiated within the context of the individual guideline which is relevant to the patient's presenting problem. Documentation in the health care record must occur promptly, and must include assessment findings, guideline used, interventions and responses to interventions. Any medications used within the context of a guideline's standing order must be documented on the medication chart and signed by an MO within 24 hours.

It is intended that:

- When a Paediatric FLECC credentialed nurse utilises the Guideline, an MO will be notified immediately to ensure their early involvement with the management and care of the patient.
- Any medications used within the context of a standing order within a guideline must be documented on the medication administration record and signed by an MO within 24 hours.
- MO review of medication order is required following the administration of a drug according to the standing orders contained within this document as soon as possible (must be within 24 hours). At the time of this review the MO must check the nurse record of administration within 24 hours.

This Guideline should be read and implemented in conjunction with the criteria for standing orders as specified in Medication Handling in NSW Public Health Facilities (NSW Health 2013).

1.6 Using the Guideline safely

Clinical guidelines are designed to assist clinicians to provide consistent, evidence-based care. They should be used with clinical judgement including escalating care or seeking assistance when a patient's progress is not as expected, or concerns arise.

Being aware of specific higher risk clinical presentations and using a risk management approach will assist in the safe and appropriate use of this Guideline. The following caveats should be noted:

Often, patients do not fit the classic mould

While this Guideline provides a uniform approach to management of patients who present in a typical manner for immediately or imminently life-threatening conditions, many patients with potentially life-threatening conditions will present in an atypical manner, and/or fail to respond to the initial management as expected. Atypical presentations pose an increased risk of an adverse outcome or event.

Atypical presentations

Atypical presentations or patients whose progress or response to treatment is not as expected should trigger clinicians to consider early reassessment using a structured A to G assessment as per NSW Health's Between the Flags program, further investigation and immediate senior consultation as per local CERS. This may not only manifest as deterioration, but also where there is no change or improvement in condition.

Start over

Re-assessment means starting from scratch and approaching the patient with no preconceptions. Clinicians must ignore a 'diagnosis' that has been previously given. For example, labelling abdominal pain in an infant as constipation before serious surgical diagnoses have been ruled out, and simultaneously, consider all information available from other sources.

Re-presenting patients pose a higher risk

Any recent presentation to an ED or any other medical provider for the same complaint should flag this patient as high risk.

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Use red flags

When patients present atypically or respond in an unexpected manner it can be difficult to determine what the most important elements of patient assessment are, and what will have the greatest clinical consequence. Red flags are indicators in the patient history or examination that alert us to potential serious diagnoses that may be mimicked by more common and less sinister conditions.
Excluding potential serious diagnoses must be a conscious and active process once red flags are identified.

Health equity

Aboriginal people are over represented in ED presentations, accounting for 7.4% of NSW ED presentations in 2016-17 while 2.9% of the total NSW population identified as Aboriginal in the same period. In 2016-17, 4.3% of visits by Aboriginal patients compared with 2.9% of visits by non-Aboriginal patients ended with patients not waiting for treatment to commence. After commencing treatment, 3.1% of Aboriginal patients and 2.1% of non-Aboriginal patients left the ED at their own risk. NSW Health supports the NSW Aboriginal Health Plan 2013-2023 to achieve health equity for all Aboriginal people.

Source: Bureau of Health Information 2018.

Keep an open mind

It is acceptable to not know the diagnosis as clinical signs will evolve. Deliberately keeping an open mind, thinking broadly and escalating as per the local CERS while addressing early stabilisation and therapy, will generally avoid the wrong clinical path. Initially 'undifferentiated' patients constitute a high risk group and lack of a clear diagnosis may prevent assignment of the patient to a familiar care pathway (such as sepsis). In this situation,
re-assessment and early consultation is essential and keeping an open mind will reduce the risk of initiating inappropriate treatment.

It is helpful for clinicians to keep in mind some tried and tested 'do's and don'ts' which have been distilled from experience, research and evidence from reviewing critical incidents, and are listed below.

DO	DON'T
Ask for help at any time day or night: consult a senior colleague or referral service when in doubt: in person, via phone or Telehealth consultation	Don't dismiss a patient who re-presents from any site of medical care (not just ED) for the same problem: these patients are high risk
Maintain detailed clinical records up until what happens next so that the sequence of events and patient care plan is clear	Don't minimise or ignore any abnormal vital signs: they are significant red flags for indicating something is potentially wrong
Discharge a patient only when their pain is under control and observations are between the flags	Don't administer medication without checking allergies yourself
Discuss a plan with the patient for when the patient is next to seek medical care	Don't agree to discharge anyone who has a new unexplained reduction in their mobility
Practice your skills with your ED team regularly	Don't ignore patient or caregiver concerns about discharge home

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

1.7 Key definitions / Abbreviations

- Continuous – Uninterrupted
- Infant – One month to twelve months of age
- Neonate – Less than 28 days old
- Child/Paediatric – One year up to 16th birthday

These are the definitions used for the purposes of this document. It is acknowledged that paediatric inpatient units usually admit 0-16 years.

ABG – Arterial Blood Gas	LMA – Laryngeal Mask Airway
ALS – Advanced Life Support	LOC – Level of Consciousness
APLS – Advanced Paediatric Life Support	MCS – Multiple Chemical Sensitivity
ARC – Australian Resuscitation Council	MDI – Metred Dose Inhaler
ATS – Australasian Triage Scale	mg – Milligram
AVPU – Alert, Voice, Painful, Unresponsive	mL – Millilitre
BE – Base excess	mmHg – Millimetres
BGL – Blood glucose level	mmol/L – Millimols per Litre
BP – Blood pressure	MO – Medical Officer
BSA – Body surface area	LFT – Liver Function Test
CERS – Clinical Emergency Response System	LHD – Local Health District
CK – Creatine kinase	MRI – Magnetic Resonance Imaging
CPR – Cardiopulmonary Resuscitation	MRSA – Methicillin-resistant Staphylococcus aureus
CR – Capillary refill	MSU – Midstream urine
CNS – Central Nervous System	MVC – Motor Vehicle Crash
CRP – C Reactive Protein	NBM – Nil by mouth
CSL – Commonwealth Serum Laboratory	NETS – Newborn and Paediatric Emergency Transport Service
C-Spine – Cervical spine	NGT – Nasogastric tube
CT – Computed tomography	O_2 – Oxygen
CVAD – Central Venous Access Device	ORS – Oral Rehydration Solution
CXR – Chest X-Ray	PBI – Pressure bandage with immobilisation
EAR – Expired Air Resuscitation	PEFR – Peak Expiratory Flow Rate
ECG – Electrocardiograph	PPE – Personal protective equipment
ED – Emergency Department	PO – Per oral
ESR – Erythrocyte sedimentation rate	POCT – Point of care testing
FBC – Full Blood Count	RN – Registered Nurse
FLECC – First Line Emergency Care Course	RSV – Respiratory Syncytial Virus
g – Gram	SBP – Systolic blood pressure
GCS – Glasgow Coma Score/Scale	SOB – Shortness of breath
GP – General Practitioner	SpO_2 – Pulse oximetry saturation
H_2O – Water	Stat – Immediately and once only
Hb – Haemoglobin	TBSA – Total body surface area
hCG – Human Chorionic Gonadotropin	U/A – Urinalysis
ICU – Intensive Care Unit	UEC – Urea Electrolytes Creatinine
IDC – Indwelling catheter	UMSS – University of Michigan Sedation Score
IM – Intramuscular	UO – Urine output
IO – Intraosseous	UTI – Urinary Tract Infection
IV – Intravenous	VDK – (Snake) venom detection kit
J – Joules	VT – Ventricular tachycardia
Kg – Kilogram	Wt – weight

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Section 1
Assessing Children

If life-threatening activate your local rapid response protocol immediately.

1.8 Introduction

Infants and children are anatomically and physiologically different to adults. They have unique physical, emotional, and developmental needs. Health professionals assessing sick children need to know these differences and the subsequent impact on the child's response to injury and/or illness.

Assessment of the sick child is always tailored to the child's level of distress andtolerance.
Interventions to support the seriously ill or injured child always follow the same plan:

- Airway
- Breathing
- Circulation/Fluids
- Disability/Dextrose
- Exposure/Environment
- Fluids in and Fluids out
- Glucose

1.9 Important advice

A number of factors should be taken into consideration when assessing children in the ED, including the presenting problem, the child's behaviour, vital signs, oxygen saturation, and the degree of parental/caregiver concern. All of these factors combine to provide the nurse with an indication of the severity of illness.

There are a number of clinical signs, which should always be considered as potentially very serious and generally require immediate medical review and intervention.

These include:

Clinical severity prompts

- Airway:
  - stridor
  - choking.
- Breathing:
  - respiratory rate
  - no breath sounds on auscultation
  - persistent irritability in an infant or restlessness in the older child (may indicate hypoxia)
  - inability of an infant to feed due to breathlessness
  - increased work of breathing
  - grunting respirations.
- Circulation:
  - pallor
  - mottling
  - delayed capillary refill ≥ 3 seconds
  - tachycardia (for age) in an otherwise well looking child or significant tachycardia in any child
  - bradycardia for age
  - hypotension.
- Disability:
  - lethargy
  - poor response to painful stimuli
  - readily compliant with painful procedures
  - 'normal' vital signs in a sick looking child.

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Remember

- Size and relative body proportions change with age
- Treatment and management regimes are related to age and weight
- Infants and children are more prone to hypothermia, due to their large body surface area to mass ratio
- It is very important to keep them warm
- Infants and young children are prone to hypoglycemia: check blood glucose level regularly
- Children have unique psychological needs

All drug doses and fluids are calculated on body weight. It is essential that all children are weighed on presentation to the ED.
Weight estimation can be achieved using the Broselow™ Paediatric Emergency Tape or alternative weight calculation method. If exceptional circumstances exist and this is not possible, then the following weight for age formula can be used (as per APLS).

0-12 months wt kg = (0.5 x age in months) + 4 1-5 years
wt kg = (2 x age in years) + 8
6-12 years wt kg = (3 x age in years) + 7

1.10 Airway and breathing

When assessing respiratory rate, rhythm and pattern count for a full minute.

The table below provides a brief overview of the important differences in infants and children and the subsequent implications for your practice.

Note: By approximately 8 years of age a child's airway anatomy and physiology approximates that of adults.

Why children are different

Differences	Implications
Children < 2 years have a proportionally large head and short neck Shorter and softer trachea	Greater risk of neck flexion or overextension which may cause tracheal compression and airway obstruction
Comparatively large tongue, a small mouth and soft oropharynx	Easily obstructed, damaged and prone to swelling
Infants < 6 months of age are preferential nasal breathers	More easily obstructed by secretion Secretions in the nose may impede airway patency
Narrower airways	More easily obstructed by secretions and foreign bodies
Diaphragmatic breathers	Impeded diaphragmatic contraction (caused for example by abdominal distension) can increase or lead to respiratory distress
Epiglottis is horse shoe shaped and projects posteriorly at 45°	Intubation can be more difficult
The larynx is high and anterior	A straight blade is preferred when intubating an infant. Children are more prone to aspiration
Cricoid ring is the narrowest point of the airway and susceptible to oedema	Uncuffed or paediatric specific cuffed endotracheal tubes (Microcuff™) are used
Intercostal muscle is underdeveloped with fewer type 1 fibres than adults. (<5 years) Ribs are more horizontal	These muscles stabilise but do not lift the chest wall. They become easily fatigued and cannot sustain long periods of increased respiratory demand
The cartilaginous chest wall is more compliant	The child's ability to maintain functional residual capacity or increase their tidal volume during respiratory distress is compromised
Chest wall very thin	Respiratory sounds are transmitted more readily

1.11 Pulse oximetry

Pulse oximetry should not replace clinical assessment but is a useful adjunct to patient assessment.

An age and site appropriate pulse oximetry probe must be correctly positioned in order to ensure an accurate reading. Typical paediatric sites are the finger, toe, pinna (top) or lobe of the ear. Infant sites are the foot or palm of the hand and the big toe or thumb. Less mobile sites are preferred in wiggling children (e.g. foot, palm of hand).

Remember

As with all assessments, it is important that oxygen saturation is considered in terms of the total clinical picture and not in isolation

It is important that the oximetry probe is re-sited at least every two hours, due to the risk of pressure necrosis to the skin

1.12 Oxygen therapy

Oxygen therapy is recommended to maintain oxygen saturation (SpO_2) > 94% or in infants with bronchiolitis maintain oxygen saturation (SpO_2) > 91%.

An MO must be notified when a child requires oxygen (O_2) and if there are any changes to those requirements.

When required appropriate delivery systems that may be chosen and implemented include:

- T Piece infant resuscitator (e.g. Neopuff) – suitable for infants < 10 kg. The Neopuff provides up to 100% oxygen with the advantage of PEEP to support infant ventilation. Prolonged use requires use of Oro/Nasogastric tube for gastric venting.
- Bag-valve-mask – for children requiring positive pressure ventilation. Use age appropriate bag size. Minimum flow rate is 10 litres per minute.
- Paediatric non-rebreather bag and mask – for children requiring high oxygen flow rates. The reservoir bag must remain inflated and the oxygen flow rate regulated so that the bag will only deflate by one third on inspiration. Requires a minimal oxygen flow rate of 10 litres per minute.
- Simple face mask – available in two sizes and appropriate for moderate to high oxygen flow rates. Requires a minimum flow rate of at least 6 litres per minute to effectively clear expired gases.
- Low flow nasal prongs – available in four sizes and appropriate for conscious children requiring low flow oxygen to maintain oxygen saturations. Maximum flow rate is 3 litres per minute. Low flow nasal prongs are not suitable for acutely unwell children as they cannot deliver high concentrations of oxygen.
- High flow nasal prongs are outside the scope of this document, refer to local protocols.

Refer to Appendix 3 for further information on paediatric oxygen therapy.

1.13 Circulation

Pallor, tachycardia, restlessness, irritability, decreased central capillary refill and cool peripheries may be evidence of the early stages of circulatory failure. Later signs include a slowing heart rate, decreased volume of peripheral pulses and hypotension. It is important also to remember that fluid loss may be hidden and therefore underestimated. The child with any of the above clinical signs requires early intervention to restore circulating blood volume with close observation and monitoring maintained.

Why children are different

Differences	Implications
Larger total circulating blood volume per kilogram of body weight than adults (e.g. infants have a blood volume of 80 mL/kg)	A relatively small amount of blood loss can be significant e.g. a 100 mL haemorrhage in a one- year-old child constitutes a loss of approx. 10-15% of the total circulating blood volume
Higher basal metabolic rate – 2 to 3 times that of adults	Further demands are made by illness

Vital signs are only one indication of a child's circulatory status and can only be correctly interpreted within the context of a full physical assessment. Refer to age appropriate SPOC charts for normal paediatric vital sign range.

Warning

Persistent tachycardia is an important red flag for sepsis or other serious illness

Bradycardia is an ominous sign in children and indicates cardio-respiratory collapse or raised intracranial pressure, and requires immediate medical review and intervention

Hypotension is a late and pre terminal sign of circulatory failure in children

1.14 Blood pressure

Use of the correct sized blood pressure cuff is crucial. The cuff width must be 2/3 the length of the upper arm or thigh.

Capillary refill time measured centrally on the sternum (not peripherally i.e. fingers and toes) also provides a good indication of circulatory status. Using a thumb, apply pressure to the sternum for 5 seconds.
Capillary refill should be <3 seconds.

A slower response indicates poor perfusion.

1.15 Disability

Rapid assessment of consciousness can be made by using the AVPU scale:

A *Alert*

V responds to *Voice*

P responds only to *Pain*

U *Unresponsive* to pain

For a more detailed assessment of LOC a modified paediatric GCS should be used (see *Appendix 4*).

The following table provides an overview including alerts to when further investigation is required.

Age	Normal behaviour	Alerts for serious illness
Infant (<1 year)	Good eye contact Orientates to faces Visually tracks bright objects Moves limbs spontaneously Flexion is a normal body posture Able to be consoled by primary carer	No eye contact Irritable Not interested in family/ surroundings High pitched or very weak cry Floppy Unresponsive Inconsolable
Toddler (1-3 years)	Protest when separated from parents/ primary carer Demonstrate stranger anxiety Able to be consoled by primary carer	Extreme irritability Lethargic and unresponsive Fails to protest when the parents leave
Pre-schooler (3-5 years)	Mistrustful and afraid of strange environments Curious about equipment and events Able to be consoled by primary carer	Irritable and uncooperative Lethargic and unresponsive Shows no interest in events and procedures
School age (5-10 years)	Responds readily to painful stimulus Will try to withdraw from pain	Limited response and protest

Remember

Parental anxiety should not be discounted: it is often of significance even if the child does not appear especially unwell

1.16 Exposure and environment

Abnormal temperature should prompt assessment of infection or other cause.

Infants and children are prone to hypothermia due to their large body surface area to mass ratio. It is very important to keep them warm whilst ensuring appropriate exposure for assessment of rash, bruising and injury.

Remember

Infants and young children are prone to hypoglycaemia

Check blood glucose level regularly

1.17 Psychological considerations

The child's response to injury and illness is influenced by previous experiences and their developmental level. This is influenced by their age, cognitive abilities, communication skills and family dynamics.

Emergency Departments are potentially noisy and frightening places for children and their carers.

The following table is a summary of the key developmental phases during childhood and offers some practical suggestions for your nursing practice.

Age	Strategies to minimise anxiety in the ED
Infant (<1 year)	Minimise separation from primary carer Use objects familiar to child Use a soothing gentle approach Use distraction techniques Prepare primary carer and encourage them to soothe and comfort the infant
Toddler (1-3 years)	Minimise separation from primary carer Encourage toddlers to participate in choices Where possible maintain routine Allow loud protest to procedures Gently immobilise by wrapping or holding during procedures Provide age appropriate explanations of procedures immediately prior to them occurring Avoid separation from primary carers where possible Provide praise
Pre-schooler (3-5 years)	Provide age appropriate accurate information Minimise separation from parents/ primary carer Provide choices (when possible) Use age appropriate explanations Procedural play – allow the child to handle equipment Use puppets, dolls etc Allow verbalisation of fears and feelings
School age (5-10 years)	Include parents/primary carer Include the child in their care Explain procedures in advance Use models and drawings in explanations Provide privacy Allow child to verbalise their fears and ask questions Encourage appropriate options for choice
Adolescents (13-15 years)	Encourage choices and decisions in care Provide realistic and honest explanations Use models and diagrams in explanations Provide and respect privacy Include the parents but consider adolescent's needs and requests Encourage questions and clarifications

Source: Colizza, Prior and Green 1996.

1.18 Fluid and electrolytes

Children have	Implications
High percentage of total body weight is water Greatest percentage of fluid is located in the extracellular compartment	A relatively small amount of fluid loss can lead to circulatory collapse as adequate intracellular fluids cannot be drawn on to support the circulatory system
Large surface area to body weight ratio – greater insensible fluid losses	Insensible fluid losses are influenced by illness, and are increased further if the child is febrile, tachypnoeic, or tachycardic
High metabolic rate	Illness increases the already high metabolic rate and as a result increases insensible fluid loss. This in turn increases fluid requirements
Immature renal function	Less efficient in excreting waste, concentrating or diluting urine, and conserving sodium in times of fluid loss or overload
Increased fluid requirements per kilogram of body weight	Greater amount of fluid per kilogram of body weight is required than for the older child or adult

1.19 Signs of dehydration

Description of dehydration	Dehydration (% of body weight)	Signs and Symptoms
No clinical signs of dehydration		Reduced urine output Thirst No physical signs
Mild	3%	Reduced urine output Thirst Dry mucous membranes Mild Tachycardia
Moderate	5%	Dry mucous membranes Tachycardia Abnormal respiratory pattern Lethargy Reduced skin turgor Sunken eyes
Severe	10%	Above signs Poor Perfusion – Mottled, cool limbs/slow capillary refill/altered consciousness Shock – thready peripheral pulses with marked tachycardia and other signs of poor perfusion stated above

Source: New South Wales. Agency for Clinical Innovation 2014.

1.20 Paediatric fluid requirements

Intravenous fluids are important components of emergency management of infants and children. An accurate fluid balance record should be kept for all children.

For fluid administration Standard for paediatric intravenous fluids 2nd edn (New South Wales. Agency for Clinical Innovation 2015).*See Appendix 13.*

The guideline outlines recommended fluids for:

- resuscitation/bolus
- replacement (dehydration or ongoing losses)
- maintenance.

For resuscitation/bolus:

0.9% Sodium Chloride 20 mL/kg bolus

For maintenance:

0.9% Sodium Chloride + 5% glucose

Maintenance fluid requirements per day	
First 0-10 kg	100 mL/kg/24 hrs
Next 11-20 kg	Plus 50 mL/kg/24 hrs
Next ≥ 20 kg	Plus 20 mL/kg/24 hrs

Source: New South Wales. Agency for Clinical Innovation 2014.

Alternatively:

Maintenance fluid requirements per hour		
First 0-10 kg	4 mL/kg/hr	kg x 4 mL/hr = mL/hr
Next 11-20 kg	2 mL/kg/hr	Plus kg x 2 mL/hr = mL/hr
Next ≥ 20 kg	1 mL/kg/hr	Plus kg x 1 mL/hr = mL/hr

Source: New South Wales. Agency for Clinical Innovation 2014.

Further References and Resources

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Colizza, D, Prior, M & Green, P 1996, 'The emergency department experience: the developmental and psychological needs of children', *Topics in Emergency Medicine,* vol. 18, no, 3, pp. 27-40.

Hill, E & Stoneham, M 2000, 'Practical applications of pulse oximetry', *Update in Anaesthesia*, vol. 11, no. 4, pp. 1-2.

Kilham, H, Alexander, S, Wood, N & Isaacs, D 2009, *The Children's Hospital at Westmead: handbook*, 2nd edn, McGraw-Hill Australia, Sydney, NSW.

New South Wales. Agency for Clinical Innovation 2014, *Infants and children: management of acute gastroenteritis,* 4th edn, NSW Health, Sydney.

New South Wales. Agency for Clinical Innovation 2018, *NSW Health Paediatric Resuscitation Card (2018),* NSW Health, Sydney.

New South Wales. Agency for Clinical Innovation 2015, *Standards for paediatric IV fluids*, 2nd edn, NSW Health, Sydney.

New South Wales. Clinical Excellence Commission 2013, *Recognition and management of patients who are clinically deteriorating: policy directive*, NSW Health, Sydney.

New South Wales. Ministry of Health 2012, *NSW Aboriginal Health Plan 2013-2023*, NSW Health, Sydney.

New South Wales. Ministry of Health 2013, *Medication Handling in NSW Public Health facilities*, NSW Health, Sydney. This guideline was under review at time of publication.

O'Meara, M & Watton, D (eds.) 2012*, Advanced paediatric life support: the practical approach*, 5th edn, Wiley-Blackwell, Chichester.

Southall, D, Coulter, B, Ronald, C, Nicholson, S & Parker 2002, *International child health care: a practical manual for hospitals worldwide*, BMJ Blackwell,London.

Section 2
Recognition of a Sick Baby or Child

Remember

- Generally parents know their children best and recognise when they are unwell.
- Listen to parents' concerns.

Clinical severity prompts

- any observation in the yellow or red zone including additional calling criteria on age appropriate SPOC chart/eMR
- parental concern
- age <3 months
- hypothermic
- relevant past history (including post-operative)
- chronic or complex conditions.

Additional criteria

- rash – non blanching or purpura
- neurovascular compromise.

History prompts

- onset
- events – trauma or history of trauma
- re-presentation
- co-morbidity
- immunosuppressed
- reduced or excessive input and output in 24 hrs
- incomplete immunisation
- exposure to anyone else who is sick
- medication history/management
- infant/child at risk of serious harm
- allergies.

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
	Position	Position of comfort with carer
Airway	Assess patency	Maintain airway patency Stabilise the C-spine with in-line immobilisation (if there is a possibility of injury)
Breathing	Respiratory rate and effort SpO_2 Auscultation	Assist ventilation if required Commence CPR if the patient is unconscious and absence of normal breathing Apply O_2 to maintain SpO_2 > 94%
Circulation	Perfusion Pulse – rate/volume Capillary refill (sternum) Blood pressure Colour	IV/IO cannulation/pathology Consider IO insertion if necessary Signs of Shock: tachycardia plus CR ≥ 3 seconds or abnormal skin perfusion or hypotension, give IV/IO 0.9% sodium chloride 20 mL/kg bolus
	Cardiac monitor	Monitor vital signs frequently
Disability	AVPU/GCS BGL	Monitor LOC frequently Finger prick BGL
		If < 3 mmol/L administer IV/IO 10% Glucose 2 mL/kg stat OR If no IV/IO access administer IM Glucagon 0.5 mg stat for a child < 25 kg; 1 mg stat for a child ≥ 25 kg
		Monitor finger prick BGL every 15 minutes until within normal limits
Measure and test	Pathology	If possible, take blood for blood culture, lactate and base excess, FBC, UEC, BGL. If lactate ⍰ 2 or BE ⍰ -5 immediately refer to Sepsis Guideline. Consider group and hold in trauma patients
	Pain score (1-3)	Oral Paracetamol 15 mg/kg stat. Single dose maximum 1 g and no more than 4 g in 24 hours
	Pain score (4-6)	Oral Oxycodone 1-12 months, 0.05 mg/kg (max 0.6 mg) stat 1-18 years, 0.1 mg/kg (max 5 mg) stat
	Pain score (7-10)	IV/IO Morphine 1-12 months 0.05 mg/kg. Repeat once in 5 minutes. Maximum dose of 1mg IV/IO Morphine 1-18 years 0.1 mg/kg. Repeat once in 5 minutes. Maximum dose of 10 mg OR If child 1-18 years consider intranasal Fentanyl 1.5 micrograms/kg. Maximum 100 micrograms. Repeat once in 10 minutes if necessary (titrated to pain and sedation)
	Temperature U/A	Per axilla Collect urine for MCS
	Fluid input/output	Investigate hydration status Fluid balance chart
Specific treatment	SpO_2	Apply O_2 to maintain SpO_2 > 94% Apply high flow O_2 (6-15 litres/min) via a paediatric non rebreather mask
Document assessment findings, interventions and responses in the patient's healthcare record		

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
Paracetamol *Precaution: Prior to administrationdetermine recent administration of any medicinescontaining Paracetamol (minimum dosing interval is 4 hours)*	15 mg/kg/dose 4 hourly to a maximum of 60 mg/kg/day Dose is recommended for patients of normal or average build* Single dose never to exceed 1 g and no more than 4 g in 24 hours	Oral	Stat
0.9% Sodium Chloride	20 mL/kg bolus	IV/IO	Stat
0.9% Sodium Chloride	2 mL flush	IV	As required
10% Glucose	2 mL/kg	IV/IO	Stat
Glucagon Hydrochloride	Child < 25 kg; 0.5 mg Child ≥ 25 kg; 1 mg	IM	Stat
Oxycodone	1-12 months 0.05 mg/kg (max 0.6 mg) 1-18 years 0.1 mg/kg (max 5 mg)	Oral	Stat
Fentanyl	1-18 years 1.5 micrograms/kg (maximum total dose 100 micrograms)	Intranasal	Titrated to pain and sedation. Maximum 100 micrograms per single dose. Repeat dose once in 10 minutes if necessary
Morphine sulphate	1-12 months 0.05 mg/kg 1-18 years 0.1 mg/kg	IV/IO	Stat. Repeat once in 5 minutes if necessary to a maximum dose of 1mg (1-12 months), or 10mg (1-18 years)

Source: New South Wales. Clinical Excellence Commission 2019.

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Precautions and notes

- Remember the younger patient may present with more subtle symptoms and signs and the level of suspicion should be higher.
- An age/developmentally appropriate pain scale must be used to assess pain in children *(see Appendix 8)*.
- This guideline should be read in conjunction with Recognition of a Sick Baby or Child in the Emergency Department (New South Wales. Agency for Clinical Innovation 2011).

Further References and Resources

Australian Resuscitation Council 2016, *ANZCOR guideline 12.4: medications and fluids in paediatric advanced life support*, March 2016 edn, viewed 29 June 2016.

Craig, M, Twigg, S, Donaghue, K, Cheung, N, Cameron, F, Conn, J, Jenkins, A & Silink, M 2011, *National evidence-based clinical care guidelines for type 1 diabetes in children, adolescents and adults*, Commonwealth of Australia, Canberra, ACT.

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 June 2016.

New South Wales. Agency for Clinical Innovation 2011, *Recognition of a sick baby or child in the emergency department*, NSW Health, Sydney.

New South Wales. Clinical Excellence Commission 2019, *High-risk medicines management policy*, NSW Health, Sydney.

NSW Health 2011, *Triage of patients in NSW emergency departments*, Sydney.

O'Meara, M, & Watton, DJ (eds.) 2012, *Advanced paediatric life support: the practical approach*, 5th edn, 2012, Wiley-Blackwell, Chichester.

Section 3
Airway Emergencies

3.1 Anaphylactic Reaction

Is a severe, life threatening, generalised or systemic hypersensitivity reaction.
If life-threatening activate your local rapid response protocol immediately.

Clinical severity prompts

Symptoms of anaphylaxis are potentially life threatening and include any one of the following:

- difficult/noisy breathing
- swelling of tongue
- swelling/tightness in throat
- difficulty talking and/or hoarse voice
- wheeze or persistent cough
- persistent dizziness and/or collapse
- pale and floppy (in young children).

History prompts

- acute onset – most reactions occur within 30 minutes of exposure to a trigger
- exposure to known allergen for the patient
- relevant past history including allergies
- acute onset – urticarial rash or erythema/ flushing
- gastrointestinal symptoms: vomiting, abdominal pain, incontinence
- medication history
- history of asthma/atopy
- introduction of new foods.

	Assessment	Intervention
	Position	Do not allow child to stand or walk Allow them to assume a position of comfort with carer
	Cease/remove causative agent	Administer IM *Adrenaline 10 micrograms/kg (0.01mL/kg of 1:1,000) (to a maximum of 0.5 mL) immediately, repeat every five minutes as needed
Airway	Assess patency	Maintain airway patency
	Stridor	**If airway symptoms are present, also administer nebulised undiluted Adrenaline 5 mL of 1:1,000 stat
	Hoarse voice and/or difficulty talking	If symptoms not reversed after initial IM and nebulised Adrenaline repeat IM Adrenaline every five minutes as needed and consider 2nd dose of nebulised Adrenaline after 30 minutes
Breathing	Respiratory rate and effort SpO2	Assist ventilation if required Apply O2 to maintain SpO2 > 94%
	Wheeze	If wheeze present also give Salbutamol: child 0 to 5 years 6 puffs Salbutamol 100 micrograms dose MDI + spacer stat; child 6 to 12 years 12 puffs Salbutamol 100 micrograms dose MDI + spacer stat
	If patients cannot inhale adequately use an MDI and spacer or requires oxygen therapy.	0 to 5 years: 2.5 mg Salbutamol nebule stat ≥ 6 years: 5 mg Salbutamol nebule stat Give via nebuliser mask at a minimum oxygen flow rate of 8 litres/min

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
Circulation	Perfusion Pulse – rate/volume Blood pressure Capillary refill	IV cannulation/IO needle insertion If signs of shock present: tachycardia plus CR ≥ 3 seconds or abnormal skin perfusion or hypotension, give IV/IO 0.9% sodium chloride 20 mL/kg bolus
	Cardiac monitor	Monitor vital signs frequently
Disability	AVPU/GCS + pupils	Monitor LOC frequently
Measure and test	Temperature Fluid input/output	Per axilla Fluid balance chart
Specific treatment	No response to IM Adrenaline and patient presents signs of cardiorespiratory arrest	IV/IO ***Adrenaline 10 micrograms/kg (0.1mL/kg of 1:10,000) (maximum 1mg or 10mL of 1:10,000) Follow Paediatric Life Support algorithm
Document assessment findings, interventions and responses in the patient's healthcare record		

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
*Adrenaline	10 micrograms/kg (0.01mL/kg of 1:1,000) (to a maximum of 500 micrograms or 0.5 mL of 1:1,000) per dose	IM	Stat. If symptoms not reversed Adrenaline may be repeated every five minutes as needed
**Adrenaline	5 mL of 1:1,000	Nebuliser	Stat. If symptoms not reversed second dose may be given 30 minutes after initial dose
***Adrenaline	10 micrograms/kg (0.1mL/kg of 1:10,000) (maximum 1mg or 10mL of 1:10,000)	IV/IO	Cardio respiratory arrest
Salbutamol	Child 0-5 years: 6 puffs of 100 microgram dose (= 600 micrograms) Child ≥ 6 years: 12 puffs of 100 microgram dose (= 1,200 micrograms)	Metered dose inhaler via spacer	Stat then repeat as required
Salbutamol	Child 0-5 years: 2.5 mg nebule Child 6-12 years: 5 mg nebule	Inhalation Nebuliser with a minimum oxygen flow rate of 8 litres per minute	Child 0-5 years: 2.5 mg nebule stat Child 6-12 years: 5 mg nebule stat
0.9% Sodium Chloride	20 mL/kg bolus	IV/IO	Bolus
0.9% Sodium Chloride	2 mL flush	IV/IO	As required

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed RN uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- *Adrenaline 10 micrograms/kg of 1:1,000 IM equates to Adrenaline 0.01 mL/kg of 1:1,000 IM.
- **Nebulised Adrenaline is not first-line therapy, but may be a useful adjunct to IM Adrenaline if upper airway obstruction is present.
- ***Adrenaline 10 micrograms/kg of 1:10,000 IV/IO equates to Adrenaline 0.1 mL/kg of 1:10,000 IV/IO.
- For effective salbutamol delivery the oxygen flow rate should be set at 8 L/minute.
- Skin urticaria is absent in approximately 20% of cases.
- Systemic allergic reactions can occur with urticaria, angioedema and rhinitis, but are not anaphylactic reactions as they are not life threatening.
- Death caused by anaphylactic reaction occurs most commonly in the first 45 minutes after the patient has contact with an allergen.
- Adrenaline is the most important drug for the treatment of an anaphylactic reaction.
- The best site for intramuscular (IM) Adrenaline is the anterolateral aspect of the middle third of the thigh – the needle needs to be long enough to ensure that the Adrenaline is injected into the muscle (Soar et al 2008:162).

Further References and Resources

Australian Society of Clinical Immunology and Allergy (ASCIA) 2015, *Anaphylaxis clinical update*, viewed June 2016.

Australian Technical Advisory Group on Immunisation (ATGI) 2013, *The Australian immunisation handbook,* Australian Government Department of Health and Ageing, Canberra.

Australian Prescriber 2011, *Anaphylaxis: emergency management for health professionals wall poster*, viewed 29 June 2016.

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 June 2016.

National Asthma Council Australia 2019, *Australian asthma handbook*, Version 2.0. The Council, South Melbourne.

O'Meara, M, & Watton, DJ (eds.) 2012, *Advanced paediatric life support: the practical approach*, 5th edn, Wiley-Blackwell, Chichester.

Soar, J, Pumphrey, R, Cant, A, Clarke, S, Corbett, A, Dawson, P, Ewan, P, Foëx, B, Gabbott, D, Griffiths, M, Hall, J, Harper, N, Jewkes, F, Maconochie, I, Mitchell, S, Nasser, S, Nolan, J, Rylance, G, Sheikh, A, Unsworth, DJ, Warrell D; Working Group of the Resuscitation Council (UK) 2008, 'Emergency treatment of anaphylactic reactions: guidelines for health care providers', *Resuscitation*, vol. 77, no. 2, viewed 29 June 2016.

The Royal Children's Hospital Melbourne 2015, *Clinical practice guideline: anaphylaxis*, viewed 29 June 2016.

The Sydney Children's Hospital Network 2015, *Anaphylaxis and generalised allergic reaction (GAR): practice guideline*, viewed 29 June 2016.

3.2 Croup

The clinical syndrome of a hoarse voice, barking cough and inspiratory stridor.
If life-threatening activate your local rapid response protocol immediately.

Clinical severity prompts

- corresponds with either mild, moderate or severe scale as described below
- age < 6 months consider differential diagnosis
- poor response to initial treatment
- pre-hospital treatment – manage as more severe than clinical signs indicate
- inability to maintain own airway.

History prompts

- previous severe croup
- nocturnal onset of stridor
- barking cough
- parental concern
- medication history
- allergies
- immunisation status
- representation within 24 hours
- previous history of severe croup
- known structural airway abnormality
- severe obstruction prior to presentation (also consider foreign body).

Clinical severity assessment of croup

	Mild	Moderate	Severe
Stridor	Nil or intermittent	Persisting stridor at rest	Persistent/soft stridor at rest
Respiratory distress	White or blue zone SPOC chart	Yellow zone SPOCC chart	Red Zone SPOC chart
Level of consciousness	Alert (Age Appropriate)	May be distressed but can be placated	Apathetic or restless, agitated decreased LOC

	Assessment	Intervention
Airway	Position	Position of comfort with carer
	Assess patency	Maintain airway patency Keep child calm Minimise interventions
	Severe Croup	Give nebulised undiluted Adrenaline 5 mL of 1:1,000 stat repeat after 30 minutes if required If symptoms not reversed second dose may be given 30 minutes after initial dose then oral *Dexamethasone 0.3 mg/kg (maximum 10 mg) stat OR If unable to tolerate oral medication give nebulised Budesonide 2 mg stat
Breathing	Respiratory rate and effort SpO2	Assist ventilation if required Apply O2 to maintain SpO2 > 94% Apply high flow O2 (6-15 litres/min)
	Mild	No specific treatment
	Moderate	*Oral Dexamethasone 0.3 mg/kg (maximum 10 mg) stat OR If unable to tolerate oral medication nebulised Budesonide 2 mg stat

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
Breathing	Severe	Nebulised undiluted Adrenaline 5 mL of 1:1,000 stat repeat after 30 minutes if required plus *Oral Dexamethasone 0.3 mg/kg (maximum 10 mg) stat or nebulised Budesonide 2 mg stat if unable to tolerate oral medication
		Do not disturb child unnecessarily
Circulation	Perfusion Pulse – rate/volume Colour Capillary refill Cardiac monitor	Monitor vital signs frequently but do not disturb child unnecessarily
Disability	AVPU/GCS	Monitor LOC frequently Keep child calm, minimise interventions
Specific treatment	Severe croup only	Give nebulised undiluted Adrenaline 5 mL of 1:1,000 stat If symptoms not reversed second dose may be given 30 minutes after initial dose
Document assessment findings, interventions and responses in the patient's healthcare record		

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
Adrenaline	5 mL of 1:1,000 undiluted	Nebulised	Stat. If symptoms not reversed second dose may be given 30 minutes after initial dose
*Dexamethasone	0.3 mg/kg (maximum 10 mg)	Oral	Stat
Budesonide	2 mg (1 mg/2 mL neb)	Nebulised	Stat
Prednisolone	1 mg/kg (maximum dose 60 mg)	Oral	Stat

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- *If oral Dexamethasone is not available administer oral Prednisolone 1 mg/kg stat.
- Oxygen saturations may be near normal in severe croup, yet significantly lowered in some children with mild to moderate croup.
- For ongoing management refer to Infants and Children: Acute Management of Croup (New South Wales. Agency for Clinical Innovation 2014).

Further References and Resources

Australian Medicines Handbook 2019, *AMH children's dosing companion,* viewed June 2019.

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 June 2016.

New South Wales. Agency for Clinical Innovation 2014, *Infants and children: management of acute gastroenteritis*, 4th edn, NSW Health, Sydney.

O'Meara, M, & Watton, DJ (eds.) *2012, Advanced paediatric life support: the practical approach*, 5th edn, Wiley-Blackwell, Chichester.

3.3 Foreign Body Airway Obstruction

Foreign body airway obstruction is a life threatening airway emergency, activate your local rapid response protocol immediately. It is a partial or complete obstruction to the airway caused by the inhalation of a foreign body.

Clinical severity prompts

- loss of consciousness
- ineffective cough and increasing respiratory effort
- inability to vocalise
- apnoea
- inability to establish patent airway.

History prompts

- universal choking sign (clutching the neck with the thumbs and fingers) may be seen in older children
- preschool age child
- sudden onset of respiratory distress
- paradoxical chest movements
- associated symptoms: sudden onset of cough, gagging and/or stridor.

	Assessment	Intervention
	Position	Effective cough: position of comfort with carer Ineffective cough and conscious: head down position Ineffective cough and unconscious: supine with head tilt/chin lift and jaw thrust
Airway	Assess patency Effective cough Ineffective cough and conscious Ineffective cough and unconscious	Maintain airway patency Encourage coughing Support and assess continuously Perform 5 back blows If the obstruction is not relieved perform 5 chest thrusts (see Appendix 5) Assess and repeat Open the mouth and carefully attempt to remove any visible object Unable to remove foreign body – commence CPR Continually reassess airway for presence of foreign body
Breathing	Respiratory rate and effort SpO2 Auscultation	Assist ventilation if required Apply O2 to maintain SpO2 > 94% Apply high flow O2 (6-15 litres/min)
Circulation	Perfusion Pulse – rate/volume Capillary refill Colour Cardiac monitor	Sign of respiratory/cardiac failure commence CPR Monitor vital signs frequently
Disability	AVPU/GCS	Monitor LOC frequently
Specific treatment	Severe obstruction – ineffective cough and unconscious	Unable to remove foreign body – commence CPR
Document assessment findings, interventions and responses in the patient's healthcare record		

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- Back blows can be performed by placing the baby/child along one of the rescuers arms in a head down position, with the rescuers hand supporting the infant's jaw in such a way as to keep it open, in the neutral position. The rescuer then rests their arm along the thigh, and delivers five back blows with the heel of the free hand. See *Appendix 5.*
- If the child is too large to allow the use of the single-arm technique, the same manoeuvres can be performed by laying the child across the rescuer's lap. Older child (over 9 years) manage as for adult choking – lie supine, turn onto side deliver up to 5 back blows, turn supine and perform 5 chest thrusts.
- To perform chest thrusts identify the same landmark points used for cardiac compressions. Chest thrusts are given in the same position however are sharper and delivered at a slower rate (one per second).

Further References and Resources

Australian Resuscitation Council 2016 *ANZCOR Guideline 12.4: medications and fluids in paediatric advanced life support*, viewed 29 June 2016.

NSW Health 2016, *RESUS4Kids: Managing a choking child algorithm, Sydney, NSW*.

NSW Health 2020, *RESUS4Kids: Short Practical Course Instructors Manual,* Sydney, NSW.

O'Meara, M, & Watton, DJ (eds.) 2012*, Advanced paediatric life support: the practical approach*, 5th edn, Wiley-Blackwell, Chichester.

3.4 Seizures

A sudden episode of altered behaviour, consciousness, sensation or autonomic function produced by a transient disruption of brain function.

If life-threatening, activate your local rapid response protocol immediately.

Clinical severity prompts

- child seizing on arrival to the ED
- unresponsive to pre-hospital treatment
- seizure lasting ≥ five (5) minutes
- altered level of consciousness
- inability to maintain own airway.

History prompts

- time of onset of seizure activity
- recurrent seizures without regaining consciousness
- events – mechanism of injury[6]
- fever/current febrile illness
- associated symptoms: altered level of consciousness, pale, sweaty, incontinence
- relevant past history: previous seizures, anticonvulsant medication
- medication history – pre-hospital doses of midazolam or diazepam
- allergies.

	Assessment	Intervention
	Position	Protect from further harm Do NOT restrain the patient Lay supine or positioned on his or her side (recovery position) (after tonic phase and clonic movements cease) Keep carer at hand
Airway	Assess patency	Maintain airway patency Consider oro- or nasopharyngeal airway Stabilise the C-spine with in-line immobilisation (if there is a possibility of injury)
Breathing	Respiratory rate and effort SpO_2	Assist ventilation if required Apply O_2 to maintain SpO_2 > 94%
*If seizing on arrival or witnessed seizure greater than 5 minutes A maximum of two doses of benzodiazepine should be given in any seizure episode, this includes doses given by ambulance or carer within one hour of presentation Contact referral paediatrician or NETS 1300 36 2500 for second line seizure management		
Buccal/intranasal Midazolam 0.3 mg/kg (maximum 10 mg) stat and repeat (once only) after 5 minutes if required OR IM/IV/IO Midazolam 0.15 mg/kg (maximum 5 mg) stat and repeat (once only) after 5 minutes if required		
Circulation	Skin temperature Pulse – rate/volume Capillary refill Blood pressure (post ictal)	IV cannulation/IO needle insertion/pathology Signs of shock: tachycardia plus CR ≥ 3 sec or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus
	Cardiac monitor	Monitor vital signs frequently

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
Disability	GCS + pupils reactivity post ictal BGL	Monitor LOC frequently Measure GCS post ictal Finger prick BGL
		If < 3 mmol/L administer IV/IO 10% Glucose at 2 mL/kg stat. If no IV/IO access available administer IM Glucagon; Child < 25 kg: 0.5 mg stat Child ≥ 25 kg: 1 mg stat
		Monitor finger prick BGL every 15 minutes until within normal limits
Measure and test	Pathology	If possible collect blood for FBC, UEC, calcium, magnesium, blood culture, lactate and BE. If lactate ≥ 2 or BE ≤ -5 immediately refer to Sepsis Guideline. Consider group and hold in trauma patients
	Temperature	Per axilla
Specific treatment	*If seizing on arrival or witnessed seizure greater than 5 minutes	Buccal/intranasal Midazolam 0.3 mg/kg (to a maximum of 10 mg) stat and repeat (once only) after 5 minutes if required OR IM/IV/IO Midazolam 0.15 mg/kg stat (to a maximum dose of 5 mg) and repeat (once only) after 5 minutes if required
Document assessment findings, interventions and responses in the patient's healthcare record		

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
Glucagon hydrochloride	Child < than 25 kg: 0.5 mg Child ≥ 25 kg: 1mg	IM	Stat
10% Glucose	2 mL/kg	IV/IO	Stat
Midazolam	0.15 mg/kg (to a maximum of 5 mg)	IM/IV/IO	Stat and repeat (once only) after 5 minutes if required
Midazolam	0.3 mg/kg (to a maximum of 10 mg)	Buccal/ Intranasal	Stat and repeat (once only) after 5 minutes if required
0.9% Sodium Chloride	20 mL/kg	IV/IO	Bolus
0.9% Sodium Chloride	10 mL flush	IV/IO	As required

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- * If seizure persists for 5 minutes.
- Warning: Airway obstruction, respiratory and cardiovascular depression can be severe after the administration of Midazolam and requires close monitoring and treatment.
- Observe for features of the seizure and document.
- For ongoing management refer to Infants and Children: Acute Management of Seizures (New South Wales. Agency for Clinical Innovation, 2018).

Further References and Resources

Australian Resuscitation Council 2016, *ANZCOR guideline 12.4: medications and fluids in paediatric advanced life support*, March 2016 edn, viewed 29 June 2016.

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 June 2016.

New South Wales. Clinical Excellence Commission 2019, *High-risk medicines management policy,* NSW Health, Sydney.

New South Wales. Agency for Clinical Innovation 2018, *Infants and children: acute management of seizures*, NSW Health, Sydney.

The Royal Children's Hospital Melbourne 2019, *Afebrile seizures*, Parkville, Victoria, viewed February 2020.

3.5 Unconscious Patient

Altered consciousness in a child is an uncommon but worrying presentation. It includes delirium as well as diminished consciousness. Any underlying causes should be corrected as a matter of urgency.

ALERT:

- The most common error in the management of an unconscious patient is the inadequate management of Airway, Breathing and/or Circulation.

If life-threatening activate your local rapid response protocol immediately

Clinical severity prompts

- Glasgow Coma Scale (GCS) of < 9
- inability to maintain own airway.

History prompts

- onset
- history of previous similar events
- history of injury
- history of fitting
- history of fever or other indicators of infection
- possible toxin ingestion.

	Assessment	Intervention
	Position	Lie supine
Airway	Assess patency	Maintain airway patency Consider oropharyngeal airway Stabilise the C-spine with in-line immobilisation (if there is a possibility of injury)
Breathing	Respiratory rate and effort SpO_2 Auscultation	Assist ventilation if required Apply O_2 to maintain SpO_2 > 94% Apply high flow O_2 (6-15 litres/min)
Circulation	Perfusion Pulse – rate/volume Capillary refill	IV cannulation/IO needle insertion/pathology Signs of shock: tachycardia plus CR ≥ 3 sec or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus
	Blood pressure	Cushing's Triad (hypertension, bradycardia and irregular respiration) and widened pulse pressure are late signs of raised intracranial pressure
	Cardiac monitor	Continuous cardiorespiratory monitor If asystolic or bradycardic – refer to BLS/ALS flowchart
Disability	AVPU/GCS + pupils	Monitor LOC frequently Consider airway opening manoeuvres, oro-pharyngeal airway, LMA and bag-valve mask to assist ventilation
		Consider oro-pharyngeal airway, airway opening manoeuvres and bag-valve mask to assist ventilation
	BGL	Finger prick BGL

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
Disability		If < 3 mmol/L administer IV/IO 10% Glucose at 2 mL kg stat If no IV/IO access available administer IM Glucagon; child < 25 kg 0.5 mg stat; child ≥ 25 kg 1 mg stat
		Monitor finger prick BGL every 15 minutes until within normal limits
	Possible opiate overdose (characterised by pinpoint pupils and hypoventilation)	If opiate overdose give IV/IO/Naloxone 10 micrograms/kg/dose (maximum 400 micrograms) If no response within 3 minutes give 100 micrograms/kg/dose (maximum 2 mg)
Measure and test	Pathology	If possible, take blood for blood culture, lactate and base excess, FBC, UEC, BGL If lactate ≥ 2 or BE ≤ -5 immediately refer to Sepsis Guideline Consider group and hold in trauma patients. Save serum plasma, urine and EDTA blood
		Test urine (dip stick) for sugar, ketones, and toxins
Specific treatment	Possible opiate overdose (characterised by pinpoint pupils and hypoventilation)	If opiate overdose give IV/IO/Naloxone 10 micrograms/kg/dose (maximum 400 micrograms) If no response within 3 minutes give 100 micrograms/kg/dose (maximum 2 mg)
Document assessment findings, interventions and responses in the patient's healthcare record		

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
10% Glucose	2 mL/kg	IV/IO	Stat
Glucagon hydrochloride	Child < 25 kg: 0.5 mg Child ≥ 25 kg: 1 mg	IM	Stat
Naloxone	Initial dose 10 micrograms/kg/ dose (maximum 400 micrograms) Subsequent dose 100 micrograms/kg/dose (maximum 2 mg)	IV/IO	Stat
0.9% Sodium Chloride	20 mL/kg	IV/IO	Bolus
0.9% Sodium Chloride	2 mL flush	IV/IO	As required

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- Consider causes – refer to specific Guidelines if required e.g.: head injury, anaphylaxis.
- Be alert for acute opiate withdrawal after the administration of Naloxone. The half-life of Naloxone is much shorter than the opiate. Repeated doses of Naloxone may be required.
- If IV/IO access is unavailable, both doses of Naloxone may be given IM, although it should be noted that this is not ideal as the IM route will take longer to take effect.

Further References and Resources

Australian Medicines Handbook 2019, *AMH children's dosing companion*, viewed June 2019.

Australian Resuscitation Council 2016, *ANZCOR Guideline 12.4: medications and fluids in paediatric advanced life support*, viewed March 2016.

New South Wales. Agency for Clinical Innovation 2014, *Acute management of altered consciousness in emergency departments*, NSW Health, Sydney.

New South Wales. Agency for Clinical Innovation 2018, *Infants and children: acute management of seizures*, NSW Health, Sydney.

O'Meara, M, & Watton, DJ (eds.) 2012*, Advanced paediatric life support: the practical approach*, 5th edn, Wiley-Blackwell, Chichester.

Section 4
Breathing Emergencies

4.1 Asthma

Asthma should be considered in a child with cough, wheeze and difficulty breathing.

If life-threatening activate your local rapid response protocol immediately.

Clinical severity prompts

- correspond with either mild/ moderate, severe or life – threatening scale as described below
- representation within 24 hours
- poor response to pre hospital treatment
- altered level of consciousness
- hypoxia in air.

History prompts

- asthma is unlikely to be the cause of wheezing in infants < 12 months old
- associated symptoms
- relevant past history especially of recurrent or persistent wheeze
- medication history
- trigger factors
- past presentation/s admission/s (ICU/HDU/ intubation)
- allergies or family history of allergies.

Clinical manifestation of acute asthma

Symptoms	Mild/Moderate	Severe	Life Threatening
Ability to talk	Speaks in whole sentences in one breath, young children can speak in phrases	Unable to complete sentences in one breath due to dyspnoea	Unable to talk
Oximetry in air	> 94%	90-94%	< 90%
Respiratory distress	White or blue zone SPOC	Yellow zone SPOC Obvious respiratory distress, includes: use of accessory muscles of neck, or intercostal muscles, or tracheal tug during inspiration or subcostal recession (abdominal breathing)	Red zone SPOC Poor respiratory effort, soft/ absent breath sounds
Appearance	Age appropriate, young children can move about	Reduced activity secondary to breathlessness	Drowsy, collapsed, exhaustion Cyanosis

Source: National Asthma Council Australia 2019.

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
	Position	Position of comfort
Airway	Assess patency	Maintain airway patency
Breathing	Respiratory rate and effort SpO_2	Assist ventilation if required Apply O_2 to maintain SpO_2 > 94% Apply high flow O_2 (10-15 litres/min) via a paediatric non- rebreather mask
	Mild/Moderate asthma	Salbutamol: Child 1-5 years: 6 puffs 100 micrograms MDI + spacer stat Child ≥6 years: 12 puffs 100 micrograms MDI + spacer stat Reassess severity after 10 minutes and repeat as needed Prednisolone: Child ≥6 years: oral 1 mg/kg stat (maximum dose 50 mg) *Only if poor response to salbutamol* Child 1-5 years: oral 1 mg/kg stat (maximum dose 50 mg)
	Severe asthma	Salbutamol: Child 1-5 years: 6 puffs 100 micrograms MDI + spacer stat then repeat every 20 minutes as needed Child ≥6 years: 12 puffs 100 micrograms MDI + spacer stat then repeat every 20 minutes as needed
	If poor response to Salbutamol	Ipratropium Bromide: Child 1-5 years: 250 microgram nebule 3 x 20 minutely Child ≥6 years: 500 microgram nebule 3 x 20 minutely Prednisolone: Child ≥1 year: oral 1 mg/kg stat (maximum dose 50 mg)
	If patient cannot inhale adequately to use an MDI and spacer (severe asthma)	Child 1-5 years: 2.5 mg Salbutamol nebule stat then repeat every 20 minutes as needed Child ≥6 years: 5 mg Salbutamol nebule stat then repeat every 20 minutes as needed
	Life threatening asthma	Give continuous nebulised salbutamol until breathing difficulty improves Give nebulised Ipratropium Bromide every 20 minutes for the first hour Salbutamol: Child 1-5 years: 2 x 2.5 mg nebules Child ≥6 years: 2 x 5 mg nebules Ipratropium Bromide: Child 1-5 years: 250 microgram nebule 3 x 20 minutely Child ≥6 years: 500 microgram nebule 3 x 20 minutely Prednisolone oral 1 mg/kg stat (maximum dose 50 mg) OR Hydrocortisone IV/IO 4 mg/kg (maximum 100 mg) stat if oral not tolerated

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
Circulation	Perfusion Pulse – rate/volume Capillary refill Cardiac monitor	IV cannulation/IO needle insertion/pathology; severe/life-threatening asthma Monitor vital signs frequently
Disability	AVPU/GCS	Monitor LOC frequently
Measure and test	Pathology Temperature	Collect blood for UEC, Venous Blood Gas including lactate if severe or life-threatening
Document assessment findings, interventions and responses in the patient's healthcare record		

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
Salbutamol	Child 1-5 years: 6 puffs of 100 microgram dose (=600 micrograms) Child ≥ 6 years: 12 puffs of 100 microgram dose (=1,200 micrograms)	Inhalation MDI + Spacer	Mild: Stat and repeat as needed Moderate/severe: 3 x 20 minutely
Salbutamol	Child 1-5 years: 2.5 mg nebule Child ≥6 years: 5 mg nebule	Inhalation nebuliser with a minimum flow rate of 8 litres per minute	Moderate/severe: Stat, 3 x 20 minutely
Salbutamol	Child 1-5 years: 2 x 2.5 mg nebules Child ≥6 years: 2 x 5 mg nebules	Inhalation continuous nebuliser with a minimum flow rate of 8 litres per minute	Life-threatening: Continuous until breathing difficulty improves
Ipratropium Bromide	Child 1-5 years: 250 micrograms (0.5 mL of 0.025%) solution made up to 4 mL with 0.9% Sodium Chloride Child ≥ 6 years: 500 micrograms (1 mL of 0.025%) solution made up to 4 mL with 0.9% Sodium Chloride	Inhalation nebuliser with a minimum oxygen flow rate of 8 litres per minute	Life-threatening: 3 x 20 minutely
Prednisolone	1 mg/kg (maximum dose 50 mg)	Oral	Stat
Hydrocortisone	4 mg/kg (maximum 100 mg)	IV/IO	Stat (one dose only)
0.9% Sodium Chloride	2 mL flush	IV/IO	As required

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- The Australian Asthma Handbook (2015) identifies moderate respiratory distress in the context of asthma.
- For effective salbutamol delivery via the nebuliser the oxygen flow rate should be set at 8 litres per minute.
- There is substantial evidence that Ipratropium Bromide is of limited use in acute episodes of mild to moderate asthma.
- The use of short acting beta antagonists by intermittent inhalation via MDI and spacer is now recommended in the management of acute mild and moderate asthma.
- Use a nebuliser instead of a MDI if the patient cannot inhale adequately or requires oxygen.
- Salbutamol 2.5 mg or 5 mg nebule can be made up with 2 mL 0.9% Sodium Chloride.
- For ongoing management refer to NSW Ministry of Health, 2012, PD2012_056 Infants and Children: Acute Management of Asthma.

Further References and Resources

MIMS Australia Pty Ltd, *MIMS Online*, accessed 29 June 2016.

National Asthma Council Australia 2019,*Australian Asthma Handbook*, Version 2.0. The Council, South Melbourne.

New South Wales. Agency for Clinical Innovation 2012, *Infants and children: acute management of asthma*, NSW Health, Sydney.

O'Meara, M, & Watton, DJ (eds.) 2012*, Advanced paediatric life support: the practical approach*, 5th edn, Wiley-Blackwell, Chichester.

Soar, J, Pumphrey, R, Cant, A, Clarke, S, Corbett, A, Dawson, P, Ewan, P, Foëx, B, Gabbott, D, Griffiths, M, Hall, J, Harper, N, Jewkes, F, Maconochie, I, Mitchell, S, Nasser, S, Nolan, J, Rylance, G, Sheikh, A, Unsworth, DJ, Warrell D; Working Group of the Resuscitation Council (UK) 2008, 'Emergency treatment of anaphylactic reactions: Guidelines for health care providers', *Resuscitation*, vol. 77, no. 2, viewed 29 June 2016.

The Royal Children's Hospital Melbourne 2015, *Clinical practice guideline: anaphylaxis*, viewed 29 June 2016.

4.2 Bronchiolitis

Bronchiolitis is the most common severe respiratory infection of infancy characterized by shortness of breath and wheeze.

If life-threatening activate your local rapid response protocol immediately.

Clinical severity prompts

- corresponds with either mild, moderate or severe scale as described below
- apnoea
- feeding < 50% of normal or tiring
- inability to maintain own airway.

History prompts

- age < 12 months
- parental concern
- duration of illness
- associated symptoms
- relevant past history
- fluids in and out past 24 hours.

The following infants are at risk of more serious disease:

- full term infant up to 3 months of age
- premature or low weight for gestational age
- chronic lung disease
- congenital heart disease.

Assessment and management of acute bronchiolitis

Bronchiolitis Algorithm – Initial Assessment

This table is meant to provide guidance in order to stratify severity. The more symptoms the infant has in the mod-severe categories, the more likely they are to develop severe disease.

Symptoms	Mild	Moderate	Severe
Behaviour	Normal	Some/intermittent irritability	Increasing irritability and/ or lethargy/ fatigue
Respiratory rate	Normal – mild tachypnoea	Increased respiratory rate	Marked increase or decrease in respiratory rate
Use of accessory muscles	Nil to mild chest wall retraction	Moderate chest wall retractions Tracheal tug nasal flaring	Marked chest wall retractions Marked tracheal tug Marked nasal flaring
Oxygen saturation Oxygen requirement	O_2 saturations > 92% (in room air)	O_2 saturations 90 – 92% (in room air)	O_2 saturations < 90% (in room air) Hypoxemia, may not be corrected by O_2
Apnoeic episodes	None	May have brief self-limiting apnoea	Increasingly frequent or prolonged apnoea
Feeding	Normal or slightly decreased	Difficulty feeding but able to take > 50% of normal feeds	Significant difficulty feeding with intake < 50% of normal feeds

	Assessment	Intervention
	Position	Position of comfort with carer
Airway	Assess patency	Maintain airway patency Superficial nasal suction can be considered Nasal saline drops may be used
Breathing	Respiratory rate and effort SpO_2	Severe respiratory difficulty with hypoxia uncorrected by oxygen may be assisted using T Piece infant resuscitator (e.g. Neopuff™) if available to provide Positive End Expiratory Pressure (PEEP) at 5 cm H_2O initially Apply O_2 to maintain SpO_2 > 92%
Circulation	Perfusion Pulse – rate/volume Capillary refill Colour Cardiac monitor	Monitor vital signs frequently Continue oral feeding if able using small frequent feeds, otherwise nasogastric feeding is appropriate If unable to feed seek specialist advice
Disability	AVPU/GCS	Monitor LOC frequently
Measure and test	BGL	Finger prick BGL
		If < 3 mmol/L administer IV/IO 10% Glucose at 2 mL/kg stat OR If no IV/IO access administer IM Glucagon; Child < 25 kg: 0.5 mg stat Child ≥ 25 kg: 1 mg stat
	Fluid input/output	Monitor finger prick BGL every 15 minutes until within normal limits Fluid balance chart
Specific treatment	Oxygen therapy	Apply O_2 to maintain SpO_2 > 92% Superficial nasal suction can be considered Nasal saline drops may be used
Document assessment findings, interventions and responses in the patient's healthcare record		

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	2-15 litres/min device dependent	Inhalation	Continuous
0.9% Sodium Chloride	3-5 drops per nare	Nasal	As required
10% Glucose	2 mL/kg	IV/IO	Stat
Glucagon Hydrochloride	Child < 25 kg: 0.5 mg Child ≥ 25 kg: 1 mg	IM	Stat

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- The child should be assigned to the most severe grade in which any clinical feature occurs.
- RSV is a common cause of Bronchiolitis and is very infectious; precautions should be taken to avoid cross-infection in particular hand washing.
- For ongoing management refer to Infants and Children - Acute Management of Bronchiolitis (New South Wales. Agency for Clinical Innovation 2018).

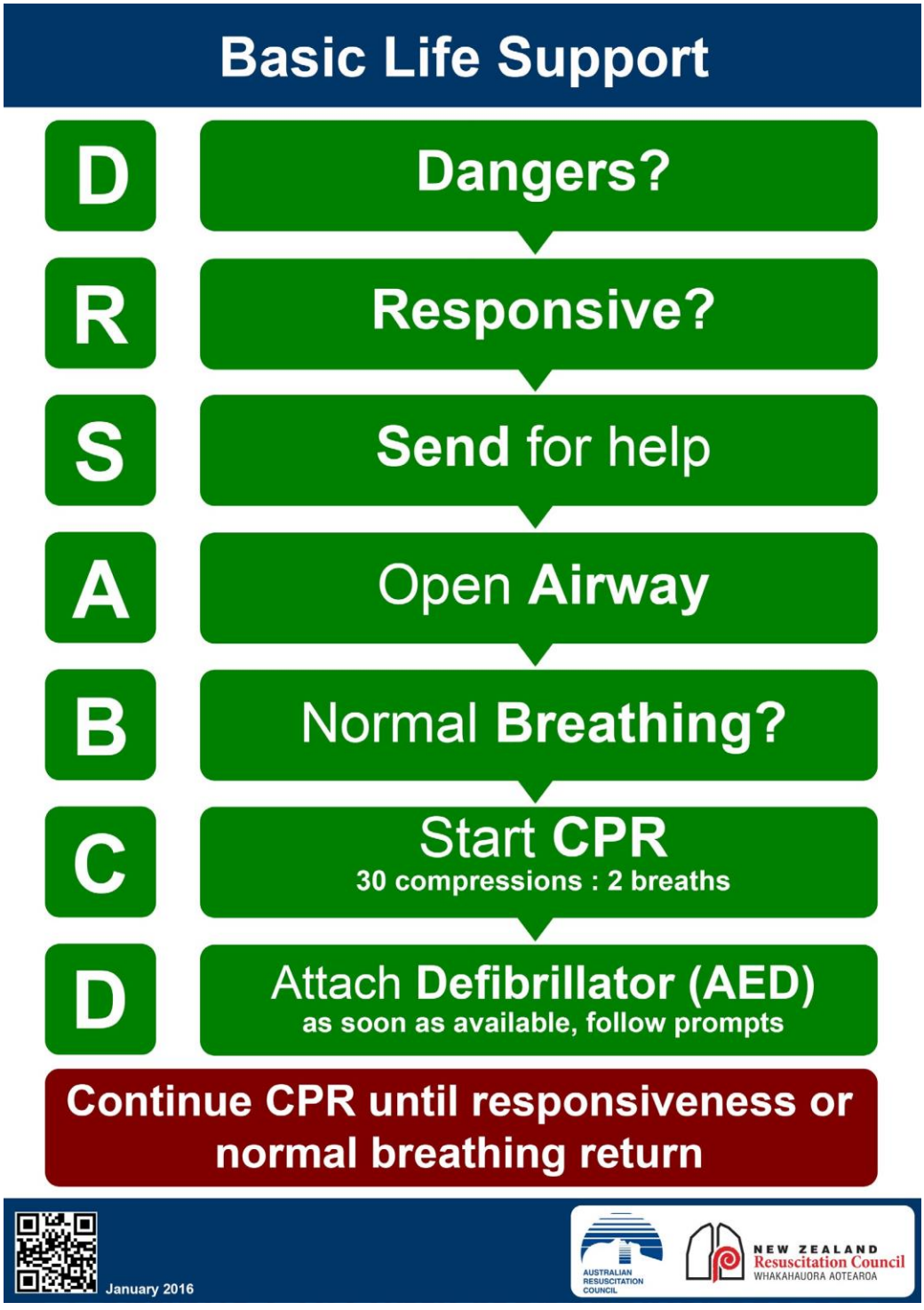
Further References and Resources

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 June 2016.

New South Wales. Agency for Clinical Innovation 2018, *Infants and children: acute management of bronchiolitis*, NSW Health, Sydney.

Section 5
Circulatory Emergencies

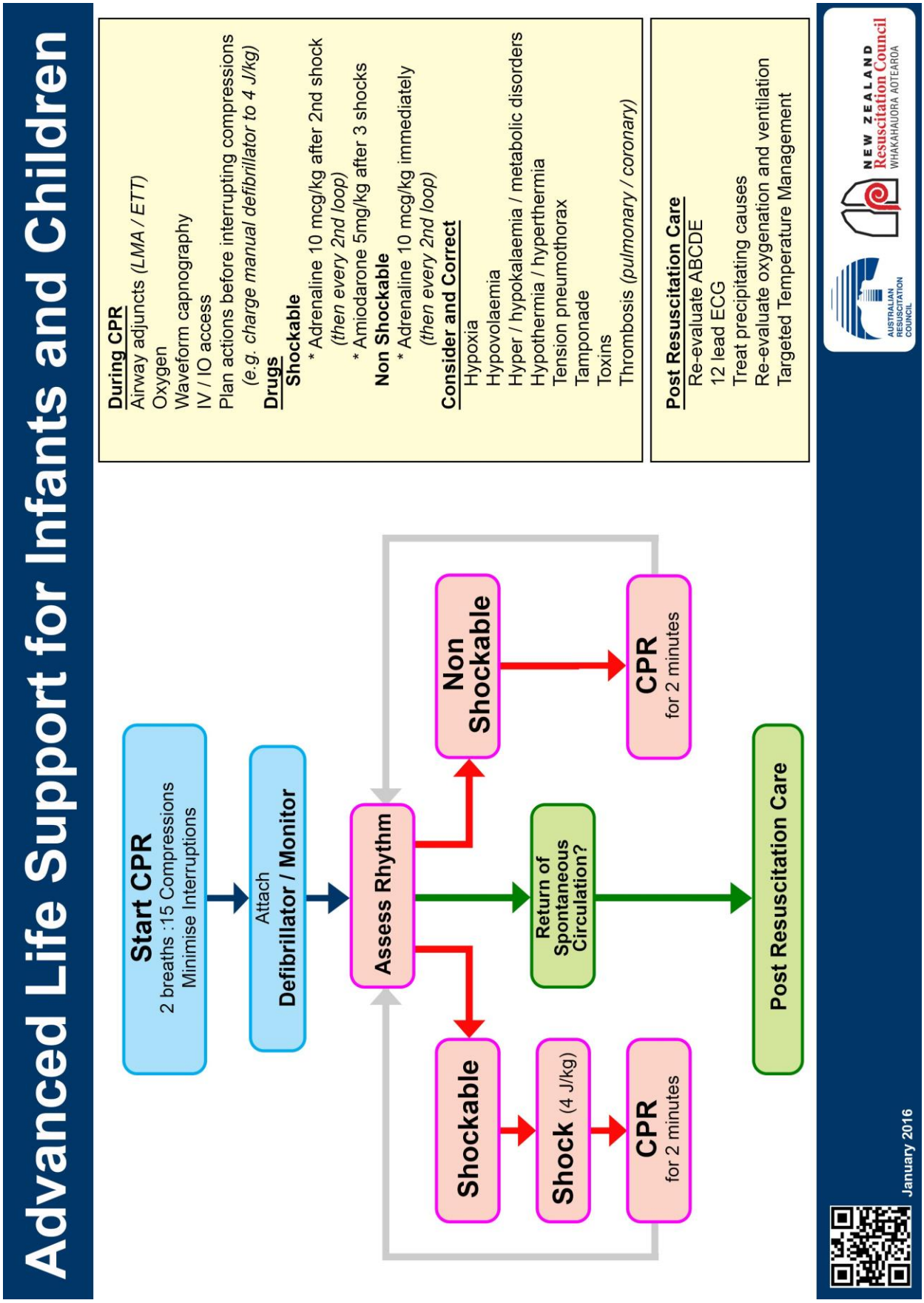
5.1 Cardiorespiratory Arrest (Basic Life Support)



Source: Australian Resuscitation Council 2016.

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

5.2 Cardiorespiratory Arrest (Advanced Life Support)



Source: Australian Resuscitation Council 2016.

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	10-15 L/min	Inhalation	Continuous
Adrenaline	10 micrograms/kg (0.1 mL/kg of 1:10,000) (maximum 1 mg or 10mL of 1:10,000)	IV/IO	Stat then 4 minutely
Amiodarone	5 mg/kg (300 mg maximum dose) diluted/ flushed with 5% Glucose	IV/IO	Stat (after 3rd shock)
0.9% Sodium Chloride	20 mL/kg	IV/IO	Bolus
0.9% Sodium Chloride	5 mL Flush	IV/IO	As required
5% Glucose	10-20 mL Flush	IV/IO	As required

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses these Guidelines, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- *Adrenaline 10 micrograms/kg of 1:10,000 IV/IO equates to Adrenaline 0.1 mL/kg of 1:10,000 IV/IO.*
- Minimum requirements for an emergency trolley are outlined in *Appendix 1*.

Further References and Resources

Australian Resuscitation Council 2016, *ANZCOR – Section 12.3: flowchart for the sequential management of life-threatening arrhythmias in infants and children*, viewed 29 June 2016.

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 June 2016.

5.3 Gastroenteritis

An acute intestinal infection that causes vomiting, diarrhoea and typically fever.

If life-threatening activate your local rapid response protocol immediately.

Clinical severity prompts

- corresponds with either mild, moderate or severe dehydration scale as described below
- representation within 48 hours
- age < 12 months
- reduced urine output
- signs of lethargy or toxicity.

History prompts

- consider alternative diagnosis if there is; abdominal distension, bile-stained vomiting, fever ≥ 39°C, blood in vomitus or stool, severe abdominal pain, vomiting in the absence of diarrhoea, headache
- parental concern
- duration and onset
- fluids in and out past 24 hours
- exposure to anyone else who is sick
- associated symptoms
- relevant past history
- management at home.

Assessment of Dehydration

Description of dehydration	Dehydration (% of body weight)	Signs and Symptoms
No clinical signs of dehydration		Reduced urine output Thirst No physical signs
Mild	3%	Reduced urine output Thirst Dry mucous membranes Mild tachycardia
Moderate	5%	Dry mucous membranes Tachycardia Abnormal respiratory pattern Lethargy Reduced skin turgor Sunken eyes
Severe	10%	Above signs Poor Perfusion – Mottled, cool limbs/slow capillary refill/altered consciousness Shock – thready peripheral pulses with marked tachycardia and other signs of poor perfusion stated above

Source: New South Wales. Agency for Clinical Innovation 2014.

	Assessment	Intervention
	Position	Position of comfort with carer
Airway	Assess patency	Maintain airway patency
Breathing	Respiratory rate and effort SpO_2	Assist ventilation if required Apply O_2 to maintain SpO_2 >94%
Circulation	Mild Moderate (not shocked)	*Diligent trial of oral fluids using ORS 0.5 mL/kg every 5 minutes ^Nasogastric rehydration 10 ml/kg/hr of ORS for 4 hours if failed trial of oral rehydration
	Severe Perfusion Capillary Refill Heart Rate/volume Colour	IV cannulation/IO needle insertion/pathology Signs of shock: tachycardia plus CR ≥ 3 sec or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus
	Cardiac monitor	Monitor vital signs frequently
Disability	AVPU/GCS BGL	Monitor LOC frequently Finger prick BGL
		If < 3 mmol/L administer IV/IO 10% Glucose at 2 mL/kg stat If no IV/IO access available administer IM Glucagon; Child < 25 kg: 0.5 mg stat Child ≥ 25 kg: 1 mg stat
		Monitor finger prick BGL every 15 minutes until within normal limits
Measure and test	Pathology	If severe collect blood for UEC, BGL at cannulation Consider FBC
	Urine Fluid output	Collect urine if available for dipstick urinalysis Fluid balance chart
Specific treatment	Severe dehydration Signs of shock	Signs of shock: tachycardia plus CR ≥ 3 sec or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus
	To reduce vomiting a one off dose of oral Ondansetron may be considered	> 6 months 8-15 kg 2 mg oral as a single dose Child ≥ 2 years: 15-30 kg oral Ondansetron 4 mg as a single dose; > 30 kg oral Ondansetron 8 mg as a single dose
Document assessment findings, interventions and responses in the patient's healthcare record		

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
Oral Rehydration Solutions e.g. Gastrolyte, Hydralyte, Pedialyte	0.5 mL/kg 10 mL/kg/hour	Oral NG	Every 5 minutes for 4 hours if failed trial of oral rehydration
10% Glucose	2 mL/kg	IV/IO	Stat
Glucagon Hydrochloride	Child < 25 kg: 0.5 mg Child ≥ 25 kg: 1 mg	IM	Stat
Ondansetron	> 6 months 8-15 kg 2 mg oral as a single dose Child ≥ 2 years: 15-30 kg: 4 mg as a single dose Child > 30 kg: 8 mg as a single dose	Oral	Stat
0.9% Sodium Chloride	2 mL flush	IV/IO	As required
0.9% Sodium Chloride	20 mL/kg	IV/IO	Bolus

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- The child should be assigned to the most severe grade in which any clinical feature occurs.
- *Oral replacement therapy (fluids) in order of preference:
  - continue breastfeeding – small frequent feeds
  - Oral Rehydration Solution (ORS) e.g. Gastrolyte or Hydralyte
  - 1 part juice or lemonade to 4 parts water (only if ORS consistently refused and child is not clinically dehydrated).
- Composition of oral rehydration solutions available in Infants and Children: Management of Acute Gastroenteritis, 4th edn (New South Wales. Agency for Clinical Innovation 2014).

- Refer to Infants and Children Insertion and Confirmation of Placement of Nasogastric and Orogastric Tubes (New South Wales Health. Agency for Clinical Innovation 2016) for correct placement and confirmation techniques for oro/nasogastric tubes.
- There are no indications for the use of anti-motility or anti-diarrhoeal agents in the management of gastroenteritis in infants and children, however a one off dose of Ondansetron (maximum 8 mg) may have some clinical benefit in children ≥ 2 years.
- For ongoing management and fluid regimes refer to Infants and Children: Acute Management of Gastroenteritis 4th edn (New South Wales. Agency for Clinical Innovation 2014).

Further References and Resources

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 June 2016.

New South Wales. Agency for Clinical Innovation 2014, *Infants and children: management of acute gastroenteritis*, 4th edn, NSW Health, Sydney.

New South Wales. Agency for Clinical Innovation 2016, *Infants and Children Insertion and Confirmation of Placement of Nasogastric and Orogastric Tubes*, NSW Health, Sydney.

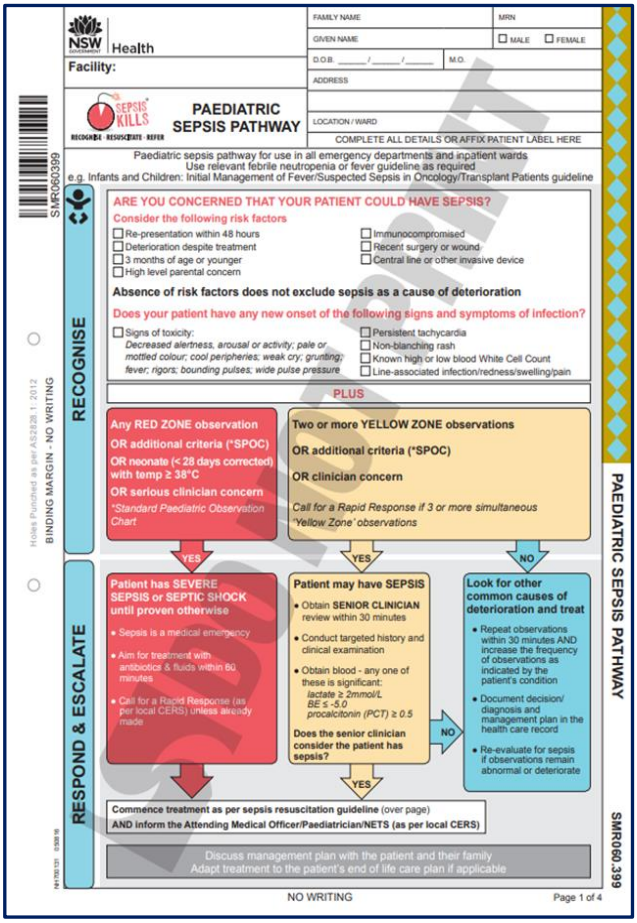
5.4 Sepsis

Sepsis is a life-threatening condition that arises when the body's response to infection injures its own tissues and organs. Sepsis can present in any patient, in any clinical setting and is a medical emergency.

Consider sepsis in a patient with two yellow zone and/or one red zone observation plus risk factors or signs of infection.

THE SEPSIS PATHWAY SHOULD BE ACTIVATED IMMEDIATELY

FIRST DOSE OF ANTIBIOTICS AND FLUID BOLUS SHOULD BE ADMINISTERED WITHIN 60 MINUTES



Source: New South Wales. Clinical Excellence Commission 2015.

Clinical severity prompts

- persistent tachycardia
- any red zone or two yellow zone observations
- representation within 48 hours
- deterioration despite treatment
- 3 months of age or younger
- immunocompromised
- high level parental concern
- signs of toxicity (decreased alertness, arousal or activity, colour pale or mottled, cool peripheries, weak cry, grunting, rigors, bounding pulses or wide pulsepressure)
- line associated infections/redness/swelling/pain
- known high or low WCC
- serious clinician concern
- neonate with temperature 38 degrees or above
- recent surgery or wound
- central line or other invasive device.

This guideline is not for use in children who have a current haematology/oncology diagnosis. Refer to Infants and Children: Initial management of Fever/ Suspected Sepsis in Oncology/Transplant patients (New South Wales. Agency for Clinical Innovation, 2015).

	Assessment	Intervention
Full PPE measures must be considered		
	Position	Position supine/position of comfort
Airway	Assess patency	Maintain airway patency
Breathing	Respiratory rate and effort SpO_2	Assist ventilation if required Apply O_2 to maintain SpO_2 > 94% Apply high flow O_2 (6-15 litres/min) via a paediatric non-rebreather mask
Circulation	Perfusion Pulse – rate/volume Capillary refill Blood pressure	IV cannulation/IO needle insertion/pathology Signs of shock: tachycardia plus CR ≥ 3 sec or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus Administer antibiotics as per specific treatment
	Cardiac monitor	Monitor vital signs frequently
Disability	AVPU/GCS BGL	Monitor LOC frequently Finger prick BGL
		If < 3 mmol/L administer IV/IO 10% Glucose at 2 mL/kg stat OR If no IV/IO access available administer IM Glucagon: Child < 25 kg: 0.5 mg stat Child ≥ 25 kg: 1 mg stat
		Monitor finger prick BGL every 15 minutes until within normal limits
Measure and test	Pathology	If possible, take blood for blood culture, lactate and base excess, FBC, UEC, Procalcitonin, BGL
Measure and test	Urine	Collect urine for MCS Consider urinary catheter and hourly urine measure
	Fluid input/output	Fluid balance chart Nil by mouth
Specific treatment	Unwell child with signs of sepsis	Contact regional Paediatrician or NETS as per local CERS
		IV cannulation/IO needle insertion Give IV/IO: Cefotaxime 50 mg/kg (maximum 2 grams) PLUS Gentamicin 1 month-10 years: 7.5 mg/kg/dose, 24 hourly (maximum 320mg) > 10 years: 6-7 mg/kg/dose 24 hourly (maximum 560mg) Plus if the child has septic shock or is at increased risk of MRSA infection: Vancomycin 25 mg/kg (maximum 750 mg) IV as a loading dose. Infuse over an hour
Document assessment findings, interventions and responses in the patient's healthcare record		

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Apply to maintain SpO_2 at 94%
10% Glucose	2 mL/kg	IV/IO	Stat
Glucagon Hydrochloride	Child <25 kg: 0.5 mg Child ≥ 25 kg: 1 mg	IM	Stat
Cefotaxime	50 mg/kg (maximum 2 grams)	IV/IO	Stat, IV push 3-5 mins
Gentamicin	1 month-10 yrs: 7.5 mg/kg/dose 24 hourly (maximum 320mg) > 10 years: 6-7 mg/kg/dose 24 hourly (maximum 560 mg)	IV/IO	Stat, IV push over 3-5 mins
Vancomycin	25 mg/kg (maximum 750mg)	IV/IO	Stat, given over one hour
0.9% Sodium Chloride	20 mL/kg	IV/IO	Bolus
0.9% Sodium Chloride	2 mL flush	IV/IO	As required

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- Collection of blood sample for culture should be attempted prior to administration of antibiotics but should not delay treatment.

Further References and Resources

Australian Medicines Handbook 2019, *AMH children's dosing companion*, viewed June 2019.

Australian Resuscitation Council 2016, *ANZCOR Guideline 12.4:– medications and fluids in paediatric advanced life support*, viewed 29 June 2016.

New South Wales. Clinical Excellence Commission 2015, *Paediatric sepsis pathway*, NSW Health, Sydney.

New South Wales. Clinical Excellence Commission 2016, *Sepsis kills: paediatric blood culture guideline*, NSW Health, Sydney.

New South Wales. Clinical Excellence Commission 2017, *Safe gentamicin prescribing in paediatrics*, NSW Health, Sydney.

O'Meara, M, & Watton, DJ (eds.) 2012, *Advanced paediatric life support: the practical approach*, 5th edn, Wiley-Blackwell, Chichester.

Therapeutic Guidelines Limited 2019, *Prescribing vancomycin for neonates and children*, viewed 20 February 2020.

Section 6
Disabilities

6.1 Suspected Bacterial Meningitis

A serious infection involving the central nervous system including the brain and meninges.

Prompt recognition and treatment improves patient outcomes.

If life-threatening activate your local rapid response protocol immediately.

Clinical severity prompts

- Appearance of non-blanching petechial or purpuric rash. Do not rely solely on the rash as it may not always occur or may occur late in the disease.
- Associated signs and symptoms include: fever or hypothermia, cerebral oedema, bulging fontanelle, high pitched cry, lethargy, irritability, neck stiffness, photophobia, altered consciousness and Cushing's Triad of raised intracranial pressure (hypertension, bradycardia and irregular respirations).
- Seizures.

History prompts

- age <3 months
- vomiting
- relevant past history
- contact with someone with meningitis
- head trauma/surgery or infection
- apnoea or history of apnoea
- maternal history of Group B streptococcusif <3 months old
- medication history including administration of prior antibiotics
- immunisation status.

	Assessment	Intervention
Full PPE measures must be worn		
	Position	Position of comfort with carer Completely undress and inspect all body surfaces for rash Non-specific erythematous rash may be present in early stages of bacterial meningitis
Airway	Assess patency	Maintain airway patency
Breathing	Respiratory rate and effort SpO_2	Assist ventilation if required Apply O_2 to maintain SpO_2 > 94%
Circulation	Perfusion Pulse – rate/volume Capillary refill Blood pressure	IV cannulation/IO needle insertion/pathology Signs of shock: tachycardia plus CR≥3 seconds or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus
	Colour Cardiac monitor	Monitor vital signs frequently

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
DO NOT DELAY ANTIBIOTIC ADMINISTRATION		
Disability	AVPU/GCS + pupils Check fontanelles BGL	Monitor LOC frequently Finger prick BGL
		If <3 mmol/L administer IV/IO 10% Glucose at 2 mL/kg stat If no IV/IO access available administer IM Glucagon; Child < 25 kg: 0.5 mg stat Child ≥ 25 kg: 1 mg stat
		Monitor finger prick BGL every 15 minutes until within normal limits
	Seizures	Buccal/Intranasal Midazolam 0.3 mg/kg stat (maximum dose of 10 mg) and repeat (once only) after 5 minutes if required OR IM/IV/IO Midazolam 0.15 mg/kg stat (to a maximum dose of 5 mg) and repeat (once only) after 5 minutes if required
Measure and test	Pathology	If possible, take blood for blood culture, lactate and base excess, FBC, UEC, BGL. Sepsis is likely if serum lactate is ≥ 2 and BE is ≤ -5
	Temperature U/A Fluid input/output	Per axilla Monitor Collect urine or MCS (clean catch) Nil by mouth Fluid balance chart
Specific treatment	Non-blanching petechial/ purpuric rash or the unwell child with a high index of suspicion for bacterial meningitis Early administration of steroids to children ≥ 3 months who have NOT been pretreated with antibiotics has shown to reduce severe hearing loss by 60%	Urgently contact regional paediatrician or NETS 1300 36 2500
		Urgently administer antibiotics 0-3 months: IV/IO Ampicillin 50 mg/kg (maximum 500 mg) stat OR IV/IO Benzylpenicillin 60 mg/kg (maximum 2.4 g) stat PLUS IV/IO Cefotaxime 50 mg/kg (maximum 2 g) stat 3 months-15 years: IV/IO Dexamethasone 0.15 mg/kg (maximum 10 mg) stat immediately prior to the administration of antibiotics as push dose AND IV/IO Cefotaxime 50 mg/kg (maximum 2 g) stat OR IV/IO Ceftriaxone 50 mg/kg/dose (maximum 2 g) stat
		Refer to specialist paediatrician for further management of antibiotics and fluids, including if known penicillin hypersensitivity
Document assessment findings, interventions and responses in the patient's healthcare record		

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
0.9% Sodium Chloride	20 mL/kg	IV/IO	Bolus
0.9% Sodium Chloride	2 mL flush	IV/IO	As required
10% Glucose	2 mL/kg	IV/IO	Stat
Glucagon hydrochloride	Child <25 kg: 0.5 mg Child ≥ 25 kg: 1 mg	IM	Stat
Ampicillin	50 mg/kg (Child<10kgmaximum500mg Child ≥ 10kg maximum 2g)	IV/IO	Stat
Benzyl penicillin	60 mg/kg (maximum 2.4 g)	IV/IO	Stat
Cefotaxime	50 mg/kg (maximum 2 g)	IV/IO	Stat
Ceftriaxone	50 mg/kg (maximum 2 g)	IV/IO	Stat
Dexamethsone	0.15 mg/kg (maximum 4 mg)	IV/IO	Stat
Midazolam	0.15 mg/kg (to maximum dose of 5 mg)	IM/IV/IO	(forseizures)stat and repeat after 5 mins if required
Midazolam	0.3 mg/kg (maximum 10 mg)	Buccal/Intranasal	(forseizures)stat and repeat after 5 mins if required

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Precautions and notes

- IM antibiotic administration is not preferred in this setting as supervening shock and hypotension may lead to failure of absorption of the injected antibiotic.
- The younger the patient, the more subtle the symptoms and signs and the higher the level of suspicion.
- Prior antibiotics modify the presentation and diagnostic yield, and should always be part of the history.
- For ongoing management refer to Infants and children: Acute management of bacterial meningitis: clinical practice guideline (New South Wales. Agency for Clinical Innovation, 2014).

Further References and Resources

Australian Resuscitation Council 2016, *ANZCOR Guideline 12.4:– medications and fluids in paediatric advanced life support*, viewed 29 June 2016.

New South Wales. Agency for Clinical Innovation 2014, *Infants and children: acute management of bacterial meningitis: clinical practice guideline*, NSW Health, Sydney.

New South Wales. Agency for Clinical Innovation 2018, *Infants and children: acute management of seizures*, NSW Health, Sydney.

New South Wales. Clinical Excellence Commission 2019, *High-risk medicines management policy*, NSW Health, Sydney.

Section 7
Envenomation/Poisoning Emergencies

7.1 Poisoning

The exposure to a toxic chemical or substance causing physical harm.

Exposure may be through a variety of routes; oral, inhalation, dermal, subcutaneous, ocular, mucosal or intravenous.

CONTACT NSW POISONS INFORMATION CENTRE 13 11 26

If life-threatening activate your local rapid response protocol immediately

Clinical severity prompts

- decreased LOC
- hypotension
- cholinergic reaction (increased secretions, wheeze, cough, SOB, delirium, ataxia, diarrhoea, vomiting, signs of shock)
- inability to maintain own airway
- symptoms suggestive of opiate overdose
- pin-point pupils
- hypoventilation
- seizures.

History prompts

- time of incident
- route of exposure
- type of contaminate/poison/drug
- quantity of ingestion/exposure
- potentially harmful substance
- information obtained from Poisons Information Centre
- reason – accidental/intentional
- relevant past history
- potential access to any drugs (including methadone, illicit drugs, medications, alcohol)
- associated symptoms
- medication history
- allergies.

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
	Position	Lie supine
Airway	Assess patency	Maintain airway patency
Breathing	Respiratory rate and effort SpO_2 Auscultation	Assist ventilation if required Apply O2 to maintain SpO_2 > 94% Apply O2 (6-15 litres/min) via a paediatric non-rebreather mask
Circulation	Skin temperature Pulse – rate/volume Capillary refill	IV cannulation/IO needle insertion/pathology Signs of shock: tachycardia plus CR≥3sec or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus
	Blood pressure Cardiac monitor	Monitor vital signs frequently Continuous cardiac monitor if tachycardic or abnormal rhythm
Disability	AVPU/GCS + pupils reactivity post ictal BGL	Monitor LOC frequently If GCS <9 and not rapidly improving, the patient may require endotracheal intubation Finger prick BGL
		If < 3 mmol/L administer IV/IO 10% Glucose at 2 mL/kg stat OR If no IV/IO access available administer IM Glucagon: Child < 25 kg: 0.5 mg stat Child ≥ 25 kg: 1 mg stat
		Monitor finger prick BGL every 15 minutes until within normal limits
	Possible opiate overdose (characterised by pin point pupils and hypoventilation) Seizures	If opiate overdose give IV/IO/IM Naloxone 10 micrograms/kg/dose (maximum 400 micrograms) If no response within 3 minutes give 100 micrograms/kg/dose (maximum 2 mg) Buccal/Intranasal Midazolam 0.3 mg/kg (to a maximum dose of 10 mg) stat and repeat (once only) after 5 minutes if required OR IM/IV/IO Midazolam 0.15 mg/kg stat (to a maximum dose of 5 mg) and repeat (once only) after 5 minutes if required
	Contaminant on skin, eyes, clothing	Where safe, remove contaminant. Call for expert advice immediately (ensure safety of patient and staff member – follow local protocols)
Measure and test	Pathology Temperature	Collect pathology for FBC, UEC, toxicology, venous blood gas
	U/A Fluid input/output	Collect urine for drug screen if unexplained symptoms exist Fluid balance chart
Specific treatment	Known or suspected ingestion	Contact Poisons Information Centre 13 11 26
Document assessment findings, interventions and responses in the patient's healthcare record		

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
10% Glucose	2 mL/kg	IV/IO	Stat
Glucagon hydrochloride	Child < 25 kg: 0.5 mg Child ≥ 25 kg: 1 mg	IM	Stat
Midazolam	0.15 mg/kg (to a maximum dose of 5 mg)	IM/IV/IO	Stat and repeat after 5 minutes if required (once only)
Midazolam	0.3 mg/kg (to a maximum dose of 10 mg)	Buccal/Intranasal	Stat and repeat after 5 minutes if required (once only)
Naloxone	Initial dose 10 micrograms/kg/dose (maximum 400 micrograms) Subsequent dose 100 micrograms/kg/dose (maximum 2 mg)	IV/IO/IM	Stat and repeat after 3 minutes if required
0.9% Sodium Chloride	20 mL/kg	IV/IO	Bolus
0.9% Sodium Chloride	2 mL flush	IV/IO	As required

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- Contact Poisons Information 13 11 26.
- Be alert for acute opiate withdrawal after the administration of Naloxone. The half-life of Naloxone is much shorter than the opiate. Repeated doses of Naloxone may be required.
- If IV/IO access is unavailable, both doses of Naloxone may be given IM, although it should be noted that this is not ideal as the IM route will take longer to take effect.
- All intentional poisoning must be admitted for assessment no matter how trivial the poisoning may be. Consult Mandatory Reporter Guide for all poisonings.

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Further References and Resources

Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed January 2020.

Australian Resuscitation Council 2016, *ANZCOR Guideline 12.4: medications and fluids in paediatric advanced life support*, viewed 29 June 2016.

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 June 2016.

New South Wales. Agency for Clinical Innovation 2018, *Infants and children: acute management of seizures*, NSW Health, Sydney.

O'Meara, M, & Watton, DJ (eds.) 2012, *Advanced paediatric life support: the practical approach*, 5th edn, Wiley-Blackwell, Chichester.

The Royal Children's Hospital Melbourne 2017, *Poisoning: acute guidelines for initial management*, viewed January 2020.

7.2 Snake/Spider Bite

ALERT:

Do not remove pressure immobilisation bandage.

If life-threatening activate your local rapid response protocol immediately

Clinical severity prompts

- neurotoxic paralysis/diplopia/dysphagia
- bleeding
- sudden collapse
- convulsions
- abdominal pain/headache, nausea/vomiting.

History prompts

- *events:* time of bite, number of bites, time and type of first aid applied, pre-hospital treatment, drug/alcohol intoxication, activity since bite, bite site/locations, bruising and/or necrosis at site
- *associated symptoms:* weakness, paralysis, headache, nausea, vomiting, abdominal pain, altered LOC, severe localised pain (spider bite), localised swelling, diaphoresis, excess salivation, painful lymph node, ptosis
- relevant past history/previous envenomation or antivenom administration
- medication history
- allergies.

ENSURE FIRST AID MEASURES HAVE BEEN IMPLEMENTED, OBTAIN EARLY ADVICE AND CONSIDER EARLY TRANSFER.

NSW POISONS INFORMATION CENTRE 13 11 26

	Assessment	Intervention
	Position	Position of comfort/keep patient immobile
Airway	Assess patency	Maintain airway patency
Breathing	Respiratory rate and effort SpO_2	Assist ventilation if required Apply O_2 to maintain SpO_2 > 94%
Circulation	First aid (Snake and/or Funnel Web Spider) First aid (Redback Spider) Skin temperature Pulse – rate/volume Capillary refill Blood pressure	Apply pressure bandage with immobilisation to all victims of snakebite and Funnel Web spider bite if not already in situ/current bandage not immobilising Cold packs or heat packs may help relieve pain. A pressure bandage is NOT recommended, and will only make the pain worse IV cannulation/IO needle insertion/pathology Signs of shock: tachycardia plus CR≥3 sec or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus
	Cardiac monitor	Monitor vital signs frequently
Disability	AVPU/GCS + pupils	Monitor LOC frequently If GCS < 9 and not rapidly improving, patient may require endotracheal intubation by a MO to protect the airway from aspiration Note: LMA does NOT protect the airway from aspiration

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
Measure and test	Pathology	Collect blood for FBC, UEC, CK, coags, group and hold
	Temperature Urine Fluid input/output	Monitor Consider IDC and observe urine for myoglobin Nil by mouth Fluid balance chart
	ECG	12 lead ECG
Specific treatment	Systemic envenomation See appendix 7	Contact Poisons Information 13 11 26 for further advice on appropriate antivenom Antivenom to patients with signs and symptoms: perioral tingling, tongue twitching, increased sweating, lachrymation, salivation, piloerection, hypertension, nausea ± malaise, dyspnoea – pulmonary oedema, decreased conscious state/coma
	Red back spider envenomation	Ice to bite site (do NOT apply pressure immobilisation bandage) Consider Redback spider antivenom on senior advice
	Immunisation status	Check immunisation status and consider tetanus immunisation requirements when patient stable
Document assessment findings, interventions and responses in the patient's healthcare record		

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
0.9% Sodium Chloride	20 mL/kg	IV/IO	Bolus
0.9% Sodium Chloride	2 mL flush	IV/IO	As required

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- Antiserum dose is not based on the patient's size/ weight but on the amount required to neutralise the toxin, therefore in general children will receive the full adult dose.
- Please refer to Primary Vaccination in The Australian Immunisation Handbook 10th Edition 2016.
- Snake bite and Spider bite Clinical Management Guidelines (New South Wales. Agency for Clinical Innovation 2014) should be used to guide medical staff for initial and ongoing management of these patients. Early advice and transfer must be sought.
- A Snakebite Observation Chart is recommended for recording specific signs associated with snakebites/ envenomation *(see Appendix 7)*.
- All cases of suspected or confirmed snakebite should be observed with serial blood testing for 12 hours to exclude severe envenoming using the Snakebite Clinical Pathway *(see Appendix 7)*.
- 'The pressure bandage with immobilisation (PBI) should be a broad (15 cm) elasticised bandage, rather than a crepe bandage. The bandage is applied over the bite site and then distally to proximally, covering the whole limb. It should be applied about as tight as that used for a sprained ankle. The limb and whole patient should be immobilised for the first aid to be effective'. PBI is used as first aid for snake bites and Funnel Web Spider bites only (New South Wales. Agency for Clinical Innovation 2014).
- The PBI should only be removed if antivenom is readily available and after a medical assessment and laboratory investigations have occurred to confirm that there is no evidence of systemic envenomation.
- If the patient is envenomed, the bandage can be removed after antivenom has been administered.
- If visualisation or a swab of the bite site is required it should be done through a window in the bandage, (New South Wales. Agency for Clinical Innovation 2014).
- IM injections should be avoided (except Boostrix/ADT Booster) in snake bite victims because of coagulopathy.
- Wherever possible, cases should be managed in hospitals with laboratory facilities and antivenom on-site (Point of care pathology testing is not sufficient). PoCT devices are inaccurate in testing for INR, aPTT and D-dimer in snake bite and should not be used. Patients with a suspected snake bite must be transferred to a hospital with laboratory facilities unless a formal INR can be done locally with a result available within 2 hours. However, if systemic envenomation is evident in a patient in one of the small hospitals with no on- site laboratory, antivenom treatment can and should be given prior to retrieval (New South Wales. Agency for Clinical Innovation 2014) 'One vial of the correct antivenom is sufficient to neutralise all circulating venom, however, recovery may be delayed as many clinical effects of venom are not immediately reversible' (New South Wales. Agency for Clinical Innovation 2014)
  .

Further References and Resources

Australian Medicines Handbook 2019, *AMH children's dosing companion*, viewed August 2019.

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 July 2016.

New South Wales. Emergency Care Institute 2016, *Envenomation*, NSW Health, Sydney, viewed July 2016.

New South Wales. Agency for Clinical Innovation 2014, *Snakebite and spiderbite clinical management guidelines*, 3rd edn, NSW Health, Sydney. This guideline was under review at time of publication.

O'Meara, M, & Watton, DJ (eds.) 2012, Advanced paediatric life support: the practical approach, 5th edn, Wiley-Blackwell, Chichester.

Royal Flying Doctors Service 2015, *Clinical manual: part 3 procedures, Version 7.1*, pp. 24-26, viewed 05 July 2016.

Section 8
Trauma Emergencies

8.1 Severe Burns

Download NSW Institute of Trauma and Injury Management app, or follow the
NSW burn transfer guidelines

Any child meeting retrieval criteria must be transferred in consultation with NETS 1300 36 2500

- Cool the burn surface with running tap water for a minimum of 20 minutes; this is beneficial within the first three (3) hours only, on burns < 10% Total Body Surface Area.
- Prevent hypothermia and keep the patient warm.
- If the patient has suffered chemical burns, ensure adequate protection from contamination.
- Always brush dry chemicals off (use PPE) before applying cool water.

Clinical severity prompts

- airway/facial/neck burns
- burns to hands, feet, perineum
- electrical burns including lightning injuries
- chemical burns
- circumferential burns of limbs or chest
- meets retrieval criteria.

History prompts

- onset – time of burn
- events: mechanism of injury/exposure, history of electrical/thermal/chemical/radiation burns, confined space, first aid measures – defined
- associated symptoms: cough, hoarse voice, sore throat, sooty sputum, stridor, neck/facial swelling, singed nasal or facial hair, confusion
- relevant past medical history
- assess for possibility of non-accidental injury
- medication history
- tetanus immunisation status.

	Assessment	Intervention
	Position	Position of comfort with carer
Airway	Assess patency Evidence of airway burn: hoarse voice, stridor, sore throat, sooty sputum, facial swelling	Maintain airway patency Seek early advice from NETS, prepare for possible early endotracheal intubation Stabilise the C-spine with in-line immobilisation (if there is a possibility of injury)
Breathing	Respiratory rate and effort SpO_2	Assist ventilation if required Apply high flow O_2 (10-15 litres/min) via a paediatric non-rebreather mask to all patients except those with minor burns

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
Circulation	Skin temperature Blistering	IV cannulation/IO needle insertion x 2 /pathology
	Pulse – rate/volume Capillary refill Blood pressure	Signs of shock: tachycardia plus CR≥3sec or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus
		For burns > 10% TBSA consult with NETS regarding commencement of maintenance plus replacement fluids using Modified Parkland formula
	Cardiac monitor	Continuous cardiorespiratory monitor (especially for electrical burns and lightning strikes)
	Constrictive non adhered clothing or jewellery	Remove
Disability	AVPU/GCS BGL	Monitor LOC frequently Finger prick BGL
Measure and test	Primary survey Pain score (1-3)	Repeat Oral Paracetamol 15 mg/kg stat Single dose never to exceed 1 gm and no more than 4 gms in 24 hours.*
	Pain score (4-6) Pain score (7-10)	Oral Oxycodone 1-12 months 0.05 mg/kg (max 0.6 mg) stat 1-18 years 0.1 mg/kg (max 5 mg) stat IV/IO Morphine 1-12 months 0.05 mg/kg. Repeat once in 5 minutes. Maximum dose of 1 mg IV/IO Morphine 1-18 years 0.1 mg/kg. Repeat once in 5 minutes. Maximum dose of 10 mg OR If 1-18 years intranasal Fentanyl 1.5 micrograms/kg (maximum 100 micrograms). Repeat once in 10 minutes if necessary (titrated to pain and sedation)
		Cover burn and consider non pharmacological measures early such as supportive and distractive techniques
	Secondary survey Pathology	Commence Collect blood for FBC, UEC, BGL, (consider group and hold, venous blood gas)
	Temperature	Avoid hypothermia
	Assess TBSA	Calculate burn total body surface area using the Burn patient emergency assessment and management chart
	U/A Fluid input/output	Ward U/A including urine myoglobin Monitor – maintain UO at 2 mL/kg/hour Fluid balance chart
	Burns > 10% TBSA	Nil orally if burns TBSA > 10-15% For burns > 10% TBSA, consider indwelling catheter to measure and record urine output every hour

Source: New South Wales. Clinical Excellence Commission 2019.

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
Specific treatment	Liquid chemical Powder chemical	Copious water irrigation Brush off prior to copious water irrigation Staff must use Personal Protective Equipment
	Electrical/lightning strike	Maintain UO > 2 mL/kg/hour
	Circumferential burns	Elevate the affected limb above the level of the heart Perform neurovascular observations every 15 minutes
	Burn wounds	If transferring within 8 hours wrap the burns with cling wrap. If the face is burnt, paraffin ointment should be applied If there is a delay in transfer wound management should be in consultation with the burn surgeon who will receive the patient or with NETS
		Do not use Silver Sulphadiazine (SSD) cream without consulting the tertiary burns service and do not apply to the face
	Gastrointestinal care	Patients with major burns must remain nil by mouth until after consultation with the appropriate burns unit
	Immunisation status	Check immunisation status and consider tetanus immunisation requirements when patient stable
Document assessment findings, interventions and responses in the patient's healthcare record		

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	10–15 L/min	Inhalation	Continuous
Paracetamol *Precaution: Prior to administration determine recent administration of any medicines containing Paracetamol (minimum dosing interval is 4 hours)*	15 mg/kg/dose 4th hourly to a maximum of 60 mg/kg/day Dose is recommended for patients of normal or average build* Single dose never to exceed 1 g and no more than 4 g in 24 hours	Oral	Stat
Oxycodone	1-12 months, 0.05 mg/kg (max 0.6 mg) 1-18 years 0.1 mg/kg (max 5 mg)	Oral	Stat
Fentanyl	1-18 years 1.5 micrograms/kg (maximum total dose 100 micrograms)	Intranasal	Repeat once in 10 minutes if necessary (titrated to pain and sedation)
Morphine sulphate	1-12 months 0.05 mg/kg 1-18 years 0.1 mg/kg	IV/IO	Stat
0.9% Sodium Chloride	20 mL/kg	IV/IO	Bolus
0.9% Sodium Chloride	2 mL flush	IV/IO	As required

*Source: New South Wales. Clinical Excellence Commission 2019.

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- Consult with burns specialist (or NETS) early.
- Children have different body surface area proportions.
- Paracetamol dose should be based on ideal body weight.
- For ongoing fluid management in children, maintenance fluids should be added to the fluid calculated with the Modified Parkland formula with advice from NETS.
- Do not use ice to cool burn.
- Be cautious in administration of Morphine if there is an altered level of consciousness, respiratory compromise or hypotension. Use of sedation scores may be beneficial in reassessment.
- Children who have completed a full primary immunisation course within the last 5 years will not require further immunisation.
- Individuals who have no documented history of receiving a primary vaccination course (3 doses) of tetanus toxoid–containing vaccines should receive a complete primary course. Please refer to Primary Vaccination in The Australian Immunisation Handbook 10th Edition2016.

Further References and Resources

Australian Resuscitation Council 2016, *ANZCOR Guideline 9.1.3: burns*.

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 July 2016.

New South Wales. Agency for Clinical Innovation 2017, *NSW burn transfer guidelines*, 4th edn, NSW Health, Sydney.

New South Wales. Emergency Care Institute, *Clinical tools: burns*, Emergency Care Institute, viewed July 2016.

New South Wales, Clinical Excellence Commission 2019, *High-risk medicines management policy*, NSW Health, Sydney.

O'Meara, M, & Watton, DJ (eds.) 2012*, Advanced paediatric life support: the practical approach*, 5th edn, Wiley-Blackwell, Chichester.

8.2 Drowning

Drowning is the process of experiencing respiratory impairment from submersion/ immersion in liquid.

Clinical severity prompts

- altered level of consciousness
- wheezing
- crepitations
- pink frothy sputum
- tachycardia
- hypothermia
- respiratory or cardiac arrest.

History prompts

- in diving accidents or the unconscious submersion victim, spinal and head injuries must be considered
- consider:
  - the possibility of associated drug and or alcohol use
  - attempted self-harm
  - syncope or seizure as a precipitating event
  - circulatory arrest
- hyperventilation before breath holding underwater
- duration of immersion
- water temperature
- time of accident, time of rescue, time of first effective CPR, time of return of spontaneous circulation
- history or evidence of traumas.

	Assessment	Intervention
	Position	Sit upright depending on clinical condition Position of comfort with carer Position supine if C–spine injury is suspected or unconscious
Airway	Assess patency	Maintain airway patency Open airway, consider oro-pharyngeal airway If GCS < 9 and not rapidly improving, patient will require endotracheal intubation by MO to protect the airway from aspiration Stabilise the C-spine with in-line immobilization (if there is a possibility of injury)
Breathing	Respiratory rate and effort SpO_2	Assist ventilation if required Apply O_2 to maintain SpO_2 > 94% Apply high flow O_2 (10-15 litres/min) via a paediatric non- rebreather mask If SpO_2 falls below 94% with O_2 consult MO
	Wheeze	If wheeze present give inhaled Salbutamol: Child 1-5 years: 6 puffs Salbutamol 100 micrograms MDI + spacer stat Child ≥ 6 years: 12 puffs Salbutamol 100 micrograms MDI + spacer stat
	If patient cannot inhale adequately to use an MDI and spacer and requires oxygen	Child 1-5 years: 2.5 mg Salbutamol nebule stat Child ≥ 6 years: 5 mg Salbutamol nebule stat Give via nebuliser mask at a minimum oxygen flow rate of 8 litres/min
	Auscultation	Consider risk of pneumothorax, especially if rapid ascent from a significant depth
Circulation	Skin temperature	Remove wet clothing – cover with warm blankets
	Pulse – rate/volume Capillary refill	IV cannulation/IO needle insertion/pathology Signs of shock: tachycardia plus CR ≥ 3 sec or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
Circulation	Blood pressure Cardiac monitor Colour	Monitor vital signs frequently
Disability	AVPU/GCS BGL	Monitor LOC frequently Finger prick BGL
		If < 3 mmol/L administer IV/IO 10% Glucose at 2 mL/kg stat. If no IV/IO access available administer IM Glucagon: Child < 25 kg 0.5 mg stat; child ≥ 25 kg 1 mg stat
		Monitor finger prick BGL every 15 minutes until within normal limits
Measure and test	Pathology Temperature Fluid input/output	Collect blood for FBC, UEC, serum glucose, venous blood gas if available Avoid hypothermia Core temperature if possible Fluid balance chart
	Chest X Ray	Consider in-dwelling catheter and hourly measures
		If available
Specific treatment	Gastric distension	No attempt should be made to empty the stomach by external pressure Consider gastric decompression with an oro or nasogastric tube
Document assessment findings, interventions and responses in the patient's healthcare record		

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
10% Glucose	2 mL/kg	IV/IO	Stat
Glucagon Hydrochloride	Child < 25 kg: 0.5 mg Child ≥ 25 kg: 1 mg	IM	Stat
Salbutamol	Child 1-5 years: 6 puffs of 100 microgram dose (=600 mcg) Child ≥ 6 years: 12 puffs of 100 microgram dose (=1,200 mcg)	Inhalation MDI + Spacer	Stat
Salbutamol	Child 1-5 years: 2.5 mg nebule Child ≥6 years: 5 mg nebule	Inhalation Nebuliser with a minimum flow rate of 8 litres per minute	Stat
0.9% Sodium Chloride	20 mL/kg	IV/IO	Bolus
0.9% Sodium Chloride	2 mL flush	IV/IO	As required

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- The new definition of drowning includes both cases of fatal and nonfatal drowning. 'Drowning is the process of experiencing respiratory impairment from submersion/immersion in liquid' (WHO 2005). Drowning outcomes are classified as death, morbidity. WHO states that the terms wet, dry, active, passive silent and secondary drowning should no longer be used (WHO 2005). Therefore a simple, comprehensive, and internationally accepted definition of drowning has been developed.
- Hypothermia makes assessment of the circulation difficult.
- Although there are no highly reliable means of determining outcome, available scientific studies have shown that, in the absence of reversible causes (eg. poisoning, hypothermia as in iced-water drowning), prolonged resuscitative efforts for children are unlikely to be successful.

Further References and Resources

Australian Resuscitation Council 2014, *ANZCOR Guideline 9.3.2: resuscitation of the drowning victim*, Melbourne.

Australian Resuscitation Council 2016, *ANZCOR Guideline 12.4: medications and fluids in paediatric advanced life support*, Melbourne.

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 June 2016.

New South Wales. Emergency Care Institute 2017, *Drowning*, NSW Health, Sydney.

Samuel, M, & Wieteska, S (eds.) 2012, *Advanced Paediatric Life Support: The Practical Approach*, 5th edn, Wiley & Blackwood.

The Royal Children's Hospital Melbourne 2016, *Clinical practice guideline: drowning*, viewed 05 July 2016.

World Health Organization 2014, *Global report on drowning: preventing a leading killer*, viewed 05 July 2016.

Zuckerbraun, N, & Saladino, R 2005, 'Paediatric drowning: current management strategies for immediate care', *Clinical Practice Emergency Medicine,* vol. 6, no. 1, pp. 49-56.

8.3 Head Injury

If life threatening activate your local rapid response protocol immediately.

Clinical severity prompts

- Glasgow Coma Score ≤ 14 (using modified paediatric Glasgow Coma Scale for children under 4 years)
- correspond with either low risk, intermediate risk, high risk scale (see *Appendix 9*)
- loss of consciousness with a history of trauma
- visible deformities (fracture of skull or facial bones)
- known/suspected C-spine injury
- suspected fracture of skull (boggy haematoma)
- bruising around eyes or ears
- CSF leak from nose or ears
- inequality or non-reactivity of pupil/s
- age < 1 year regardless of signs and symptoms
- seizure > 1 hour post injury
- full or bulging fontanelles.

History prompts

- events–high risk mechanism of injury
- loss of consciousness
- associated symptoms: headache, confusion, irritability, memory loss, nausea, vomiting, dizziness, speech, motor and/or visual disturbances, seizure, persisting drowsiness, lethargy, irritability, headache or behaviour change
- relevant past history
- medication history
- consider non-accidental injury.

	Assessment	Intervention
	Position	Position of comfort with carer Position head up 30° unless contraindicated
Airway	Assess patency	Maintain airway patency Stabilise the C-spine with in-line immobilisation
Breathing	Respiratory rate and effort SpO_2	Assist ventilation if required Apply O_2 to maintain SpO_2 > 94%
Circulation	Skin temperature Pulse – rate/volume Capillary refill	IV cannulation/IO needle insertion/pathology Signs of shock: tachycardia plus CR ≥ 3 sec or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus
	Blood pressure Cardiac monitor	High Risk: continuous heart rate and blood pressure monitoring Intermediate Risk: half hourly vital signs monitoring 4-6 hours Low Risk: hourly until discharge
Disability	AVPU/GCS + pupils	Monitor LOC frequently Measure GCS post ictal If GCS < 9 and not rapidly improving, the patient may require endotracheal intubation by a MO to protect the airway from aspiration Consider oro-pharyngeal airway, airway opening manoeuvres and bag – valve mask to assist ventilation
	Low risk	May be discharged after medical review Hourly observations until discharge
	Intermediate risk	Half hourly observations for 4-6 hours until GCS 15 is sustained for 2 hours, then hourly observations until discharge Consider transfer CT scan if acute deterioration or persisting symptoms (see *Appendix 9)*

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
Disability	High risk	Continuous cardiorespiratory and oxygen saturation monitoring
		BP and GCS every 15-30 minutes
	Severe head injury (GCS < 9)	Urgent CT, consider urgent retrieval
		Urgent transfer/retrieval
	BGL	Contact NETS 1300 36 2500 for retrieval advice
		Finger prick BGL
		If < 3 mmol/L administer IV/IO 10% Glucose at 2 mL/kg stat If no IV/IO access available administer IM Glucagon; Child < 25 kg: 0.5 mg stat Child ≥ 25 kg: 1 mg stat
		Monitor finger prick BGL every 15 minutes until within normal limits
	Seizures	Buccal/Intranasal Midazolam 0.3 mg/kg (maximum dose 10 mg) stat and repeat (once only) after 5 minutes if required OR IM/IV/IO Midazolam 0.15 mg/kg (maximum dose 5 mg) stat and repeat (once only) after 5 minutes if required
Measure and test	Pathology	Collect blood for FBC, UEC (consider blood/ alcohol levels)
	Primary survey	Repeat
	Secondary survey	Commence
	Neurological observations	Monitor frequently
	Temperature	Protect from hypo/hyperthermia
	U/A	Test for presence of blood
	Fluid input/output	Fluid balance chart Nil by mouth if not fully conscious
	Pain score (1-3)	Oral Paracetamol 15 mg/kg stat Single dose never to exceed 1 g and no more than 4 g in 24 hours
	Pain score (4-6)	Oral Oxycodone 1-12 months 0.05 mg/kg (maximum 0.6 mg) stat 1-18 years 0.1 mg/kg (maximum 5 mg) stat
	Pain score (7-10)	IV/IO Morphine 1-12 months 0.05 mg/kg (maximum dose of 1 mg) repeat once in 5 minutes IV/IO Morphine 1-18 years 0.1 mg/kg (maximum dose of 10 mg) repeat once in 5 minutes OR If child 1-18 years consider intranasal Fentanyl 1.5 micrograms/kg (maximum 100 micrograms) repeat once in 10 minutes if necessary (titrated to pain and sedation) Use opiates with caution in Head Injury – see *Precautions and notes*
		Non pharmacological measures must be considered early – supportive and distractive techniques
Specific treatment	High Risk Severe Head Injury	Refer for urgent CT Contact NETS for management and referral advice
	Seizures	Buccal/Intranasal Midazolam 0.3 mg/kg (maximum of 10 mg) stat and repeat (once only) after 5 minutes if required OR IM/IV/ IO Midazolam 0.15 mg/kg (maximum of 5 mg) stat and repeat (once only) after 5 minutes if required
Document assessment findings, interventions and responses in the patient's healthcare record		

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
Paracetamol *Precaution: Prior to administration determine recent administration of any medicines containing Paracetamol (minimum dosing interval is 4 hours)*	15 mg/kg/dose 4th hourly to a maximum of 60 mg/kg/day Dose is recommended for patients of normal or average build Single dose never to exceed 1 g and no more than 4 g in 24 hours	Oral	Stat
10% Glucose	2 mL/kg	IV/IO	Stat
Glucagon hydrochloride	Child < 25 kg: 0.5 mg Child ≥ 25 kg: 1 mg	IM	Stat
Midazolam	0.15 mg/kg (maximum dose of 5 mg)	IM/IV/IO	Stat and repeat (once only) after 5 minutes if required
Midazolam	0.3 mg/kg (maximum dose of 10 mg)	Buccal/ Intranasal	Stat and repeat (once only) after 5 minutes if required
Oxycodone	1-12 months 0.05 mg/kg (maximum 0.6 mg) 1-18 years 0.1 mg/kg (maximum 5 mg)	Oral	Stat
*Fentanyl	1-18 years 1.5 micrograms/kg (maximum total dose 100 micrograms)	Intranasal	Repeat once in 10 minutes if necessary (titrated to pain and sedation)
Morphine sulphate	1-12 months 0.05 mg/kg 1-18 years 0.1 mg/kg	IV/IO	Stat. Repeat once in 5 minutes if necessary to a maximum dose of 1mg (1-12 months), or 10mg (1-18 years)
0.9% Sodium Chloride	20 mL/kg	IV/IO	Bolus
0.9% Sodium Chloride	2 mL flush	IV/IO	As required

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- *Intranasal Fentanyl is contraindicated in children where a base of skull fracture is suspected or if bleeding nose.
- If blood or fluid is draining from the nose or ear suspect a fractured base of skull.
- Do NOT insert nasopharyngeal airway or nasogastric tube in a patient suspected of having a fractured base of skull or nasal bone fracture.
- The provision of opioid analgesia is not contraindicated once surgical and neurological evaluation has been performed.
- Be cautious administering Morphine or Fentanyl if there is an altered level of consciousness, respiratory compromise or signs of shock. Use of sedation scores may be beneficial in this reassessment.
  See *Appendix 10*.
- A scalp laceration or intracranial bleed can result in significant blood loss in infants and toddlers.
- For explanation of head injury risk categories see *Appendix 9*.
  If suspected non-accidental injury refer to the Mandatory ReporterGuide.
- For ongoing head injury management refer to Infants and Children: Acute Management of Head Injury (New South Wales. Agency for Clinical Innovation 2011).

Further References and Resources

Australian Resuscitation Council 2016, *ANZCOR Guideline 12.4: medications and fluids in paediatric advanced life support*, Melbourne.

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 June 2016.

National Institute for Health and Care Excellence 2019, *Head injury: assessment and early management. Clinical guideline (CG176)*, NICE, London.

New South Wales. Agency for Clinical Innovation 2011, *Infants and children: acute management of head injury*, NSW Health, Sydney.

New South Wales, Clinical Excellence Commission 2019, *High-risk medicines management policy*, NSW Health, NSW Health, Sydney.

The Royal Children's Hospital Melbourne 2018, *Clinical practice guideline: head injury*, viewed 16 January 2020.

Schutzman, S 2016, *Minor head trauma in infants and children: evaluation*, viewed 05 July 2016.

Section 9
Other Emergencies

9.1 Abdominal Pain

May be benign or imminently life threatening.

If life-threatening activate your local rapid response protocol immediately.

Clinical severity prompts

- signs of shock
- bile stained (green) vomiting
- bloody stool
- distension
- localised tenderness
- severe pain
- inguinoscrotal pain or swelling
- rapid onset.

History prompts

- nature and time of onset
- associated symptoms
- nature of pain/radiation
- nausea, vomiting
- diarrhoea/firm stool
- fever +/- respiratory distress
- last menstrual period/symptoms of pregnancy
- urinary symptoms
- weight loss
- relevant past history
- immunocompromised
- medication history
- events – mechanism of injury (if trauma involved).

	Assessment	Intervention
	Position	Position of comfort with carer
Airway	Assess patency	Maintain airway patency
Breathing	Respiratory rate and effort SpO_2	Assist ventilation if required Apply O_2 to maintain SpO_2 > 94%
Circulation	Skin temperature Pulse – rate/volume Capillary refill Blood pressure	IV cannulation/IO needle insertion/pathology Signs of shock: tachycardia plus CR ≥ 3 sec or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus
	Cardiac monitor	Monitor vital signs frequently
Disability	AVPU/GCS + pupils BGL	Monitor LOC frequently Finger prick BGL
		If < 3 mmol/L administer IV/IO 10% Glucose at 2 mL/kg stat. If no IV/IO access available administer IM Glucagon; Child < 25 kg: 0.5 mg stat Child ≥ 25 kg: 1 mg stat
		Monitor finger prick BGL every 15 minutes until BGL above 3 mmol/L If BGL is >10 mmol/L consider DKA or acute surgical abdomen escalate as per local CERS
Measure and test	Abdominal assessment Pain score (1-3)	Look, listen and feel Oral Paracetamol 15 mg/kg stat if not nil by mouth Single dose never to exceed 1 g and no more than 4 g in 24 hours

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

	Assessment	Intervention
	Pain score (4-6)	Oral Oxycodone 1-12 months 0.05 mg/kg (maximum 0.6 mg) stat 1-18 year 0.1 mg/kg (maximum 5 mg) stat
	Pain score (7-10)	IV/IO Morphine 1-12 months 0.05 mg/kg (maximum dose 1 mg) Repeat once in 5 minutes IV/IO Morphine 1-18 years 0.1 mg/kg (maximum dose 10 mg) Repeat once in 5 minutes OR Intranasal Fentanyl if 1-18 years 1.5 micrograms/kg (maximum 100 micrograms) repeat once in 10 minutes if necessary (titrated to pain and sedation)
		Non pharmacological measures must be considered early – supportive and distractive techniques
	Pathology	Collect blood for lactate, base excess, FBC, UEC, (blood culture if febrile, consider LFT's, amylase, coags, group and hold) Sepsis is likely if serum lactate is ≥ 2 or base excess is ≤ -5
	Temperature	Per axilla
	U/A (clean catch) Fluid input/output	Ward U/A, Urine hCG, MCS Fluid balance chart
Specific treatment	Hydration/input	Nil by mouth if surgery likely to be necessary within 2 hours
	Nausea and vomiting	Record and report – fluid balance chart
Document assessment findings, interventions and responses in the patient's healthcare record.		

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
Paracetamol *Precaution: Prior to administration determine recent administration of any medicines containing Paracetamol (minimum dosing interval is 4 hours).*	15 mg/kg/dose 4th hourly to a maximum of 60 mg/kg/day Dose is recommended for patients of normal or average build* Single dose never to exceed 1 g and no more than 4 g in 24 hours	Oral	Stat
10% Glucose	2 mL/kg	IV/IO	Stat
Glucagon hydrochloride	Child < 25 kg: 0.5 mg Child ≥ 25 kg: 1 mg	IM	Stat
Oral liquid Oxycodone	1-12 months 0.05 mg/kg (max 0.6 mg) 1-18 years 0.1 mg/kg (max 5 mg)	Oral	Stat
**Fentanyl	1-18 years: Fentanyl 1.5 micrograms/kg. Maximum 100 micrograms	Intranasal	Repeat once in 10 minutes if necessary (titrated to pain and sedation)

Source: New South Wales. Clinical Excellence Commission 2019.

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Drug	Dose	Route	Frequency
Morphine sulphate	1-12 months 0.05 mg/kg 1-18 years 0.1 mg/kg	IV/IO	Stat (repeat once in 5 minutes if necessary to a maximum dose of 1mg (1-12 months), or 10 mg (1-18 years)
0.9% Sodium Chloride	20 mL/kg	IV/IO	Bolus
0.9% Sodium Chloride	2 mL flush	IV/IO	As required

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- Early administration of Morphine Sulphate in patients with acute abdominal pain does not reduce the detection rate of serious pathology but may actually facilitate it.
- Redcurrant jelly stool is suggestive of intussusception which is a surgical emergency.
- Green bile stained vomitus is an indication of intestinal obstruction until proven otherwise and requires urgent surgical review.
- For ongoing management refer to Infants and Children: Acute Management of Abdominal Pain (New South Wales. Agency for Clinical Innovation 2013).

Further References and Resources

Australian Resuscitation Council 2016, *ANZCOR Guideline 12.4: medications and fluids in paediatric advanced life support*.

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 June 2016.

New South Wales. Agency for Clinical Innovation 2013, *Infants and children: acute management of abdominal pain*, NSW Health, Sydney.

New South Wales. Clinical Excellence Commission 2019, *High-risk medicines management policy,* NSW Health, Sydney.

9.2 Febrile Neutropenia

Children undergoing therapy for cancer or stem cell transplantation represent a unique group of patients with a significantly elevated risk of severe infection.

If life-threatening activate your local rapid response protocol immediately.

Clinical severity prompts

- haematology/oncology patient presents with fever during treatment or ceased treatment within the last 3 months
- aplastic anaemia or chronic neutropenia
- Central Venous Access Device (CVAD) insitu
- received chemotherapy within the last 6 weeks
- absolute neutrophil count < 1.0 x 109/L within the last 7 days
- Hodgkin's disease
- less than 12 months of age
- clinical presentation suggestive of shock.

History prompts

- recipients of bone marrow or stem cell transplant in the last 12 months
- a single temperature ≥ 38^0C by any route at home or on presentation
- medical history
- treatment history
- see patient journal
- parental concern.

	Assessment	Intervention
	Position	Position of comfort with carer in protective isolation
Airway	Assess patency	Maintain airway patency
Breathing	Respiratory rate and effort SpO_2	Assist ventilation if required Apply O2 via non-rebreather mask to maintain SpO2 > 94%
Circulation	Perfusion Pulse – rate/volume Capillary refill	IV cannulation/IO needle insertion/pathology Signs of shock: tachycardia plus CR≥ 3 sec or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus
	Blood pressure Colour Cardiac monitor	Monitor vital signs frequently
Disability	AVPU/GCS	Monitor LOC frequently
Measure and test	Pathology	Collect blood for lactate, BE, LFT's, BGL, FBC, UEC, Blood Cultures, group and hold
	Temperature U/A (clean catch) Fluid input/output	Per axilla Collect urine for MCS but do not delay treatment Fluid balance chart
Specific treatment	Contact Oncologist/ Paediatrician as soon as practicable	Plan for urgent administration of IV Antibiotics as per Infants and Children: Initial management of Fever/Suspected Sepsis in Oncology/ Transplant Patients
Document assessment findings, interventions and responses in the patient's healthcare record		

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	15 L/min Non-rebreather mask	Inhalation	Continuous
0.9% Sodium Chloride	20 mL/kg	CVAD/IV/IO	Bolus
0.9% Sodium Chloride	2 mL flush	CVAD/IV/IO	As required

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

Precautions and notes

- Child must be allocated minimum ATS Category 2 and must be assessed within 10 minutes of presentation to ED.
- Child must be nursed in protective isolation.
- In the febrile Haematology/ Oncology patient consider infection until proven otherwise.
- Neutropenic hosts have a decreased ability to manifest an inflammatory response: signs and symptoms may be subtle. Absence of fever in cancer patients with localising signs does not mean that the infection is controlled or insignificant.
- Do not wait 1 hour for topical local anaesthetic to work in the febrile oncology patient.

Further References and Resources

MIMS Australia Pty Ltd, *MIMS Online*, viewed 29 June 2016.

New South Wales. Agency for Clinical Innovation 2015, *Infants and children: initial management of fever/suspected sepsis in oncology/transplant patients*, NSW Health, Sydney.

9.3 Pain – Any Cause

Clinical severity prompts

- severe pain
- pain not relieved by usual measures
- painful mechanism of injury/illness
- observations in Red or Yellow Zone on SPOC.

History prompts

- nature, duration and onset of pain
- re-presentation
- co-morbidity / chronic or complex condition
- age
- medication history
- associated symptoms
  - trauma
  - obvious deformity
  - swelling
  - recent surgery or indwelling device.

	Assessment	Intervention
	Position	Position of comfort with carer
Airway	Assess patency	Maintain airway patency Stabilise the C-spine with in-line immobilisation (if there is a possibility of injury)
Breathing	Respiratory rate and effort SpO_2	Assist ventilation if required Apply O_2 to maintain SpO_2 > 94%
Circulation	Perfusion Pulse – rate/volume Capillary refill Blood pressure	IV cannulation if requiring ongoing pain management for severe pain Monitor vital signs frequently
Disability	AVPU/GCS Pain Score	Monitor LOC frequently Use age appropriate validated pain tool (see Appendix 8) Reassess pain regularly
Measure and test	Pain score (1-3)	Oral Paracetamol 15 mg/kg stat. Single dose never to exceed 1 g and no more than 4 g in 24 hours
	Pain score (4-6)	Oral Oxycodone 1-12 months 0.05 mg/kg (maximum 0.6 mg) stat, 1-18 years 0.1 mg/kg (maximum 5 mg) stat PLUS Paracetamol 15 mg/kg (maximum dose 1 gram)
	Pain score (7-10)	IV/IO Morphine 1-12 months 0.05 mg/kg (maximum dose of 1 mg) repeat once in 5 minutes. IV/IO Morphine 1-18 years 0.1 mg/kg (maximum dose of 10 mg) repeat once in 5 minutes OR If 1-18 years consider intranasal Fentanyl 1.5 micrograms/kg (maximum 100 micrograms) repeat once in 10 minutes if necessary (titrated to pain and sedation)
Specific treatment	Non Pharmacological	Age appropriate distraction techniques RICE, splinting Comfort from carer
	Laceration ≤ 5 cm	ALA/Laceraine™ Gel Children aged 1 to 3 years 0.1mL/kg to a maximum of 2mL Children 3 years to adult 0.1 mL/kg to a maximum of 3mL Wounds should not require volumes greater than the dose limits for lacerations less than 5cm in length OR 1mL for each cm of laceration, whichever is the lesser volume.

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

		Cover with occlusive dressing and leave the occlusive dressing in place for a minimum of 20 minutes to a maximum of 60 minutes. Remove after 60 minutes. Clean and/or irrigate the wound ensuring all Laceraine® is removed prior to cleaning and repairing the wound. Onset of action 20 minutes, duration maximum 60 minutes. Do not use on distal digits, nose, pinna ear, genitalia
Document assessment findings, interventions and responses in the patient's healthcare record		

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
Oxygen	6–15 L/min	Inhalation	Continuous
Paracetamol *Precaution: Prior to administration determine recent administrationofany medicines containing Paracetamol (minimum dosing interval is 4 hours)*	15 mg/kg/dose 4th hourly to a maximum of 60 mg/kg/ day Dose is recommended for patients of normal or average build Single dose never to exceed 1 g and no more than 4 g in 24 hours	Oral	Stat
Oxycodone	1-12 months 0.05 mg/kg (max 0.6 mg) 1-18 years 0.1 mg/kg (max 5 mg)	Oral	Stat
**Fentanyl	1-18 years 1.5 micrograms/kg (maximum total dose 100 micrograms)	Intranasal	Repeat once in 10 minutes if necessary (titrated to pain and sedation)
Morphine sulphate	1-12 months 0.05 mg/kg 1-18 years 0.1 mg/kg	IV/IO	Stat Repeat once in 5 minutes if necessary to a maximum dose of 1mg (1-12 months), or 10mg (1-18 years)
0.9% Sodium Chloride	2 mL flush	IV/IO	As required
ALA/Laceraine™ Gel [I]	Children aged 1-3 years 0.1mL/kg to a maximum of 2mL Children 3years to adult 0.1mL/kg to a maximum of 3mL Wounds should not require volumes greater than the dose limits for lacerations less than 5cm in length OR 1mL for each cm of laceration, whichever is the lesser volume	Topical	Stat

Medications within this guideline must be administered within the context of the formulary.

- Following the administration of a medication according to the standing orders contained within this document, the Medical Officer must review and countersign (within 24 hours) the nurse's record of administration on the medication chart.
- If a Paediatric FLECC Credentialed Nurse uses this Guideline, a Medical Officer will be notified immediately to ensure their early involvement with the management and care of the patient.

Authorising Medical Officer Signature:	
Name:	
Designation:	Date:
Drug Committee Approval:	Date:

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Precautions and notes

- Remember the younger patient may present with more subtle symptoms and signs and the level of suspicion should be higher.
- 24% oral sucrose can be used for minor painful procedures in infants up to six months of age. Refer to local protocols.
- An age/developmentally appropriate pain scale must be used to assess pain in children (see *Appendix 7*).
- This guideline should be read in conjunction with GL2016_009 Infants and Children: Management of Acute and Procedural Pain in the Emergency Department.

Further References and Resources

Australian and New Zealand College of Anaesthetists and Faculty of Pain Management 2015, *Acute pain management: scientific evidence*, 4th edn, viewed 20 January 2020.

UpToDate 2019, *Evaluation and management of pain in children*, viewed 20 January 2020.

9.4 Fever

Important

- Assessment of the cause of fever is more important than symptomatic treatment
- The response of fever to antipyretics should not be interpreted as a guide to the severity of cause
- Antipyretics do not reduce the risk of febrile convulsions

Clinical severity prompts

- age ≤ 3 months
- observations in the red or yellow zone SPOC
- presence of signs of toxicity/sepsis*
- presence of a focus of infection**
- non blanching purpuric rash
- fever lasting longer than 5 days.

History prompts

- onset: history of fever is as important as documented fever
- re-presentation
- co-morbidity
- immunosuppressed
- respiratory distress
- cough
- recent travel
- rash
- localised pain
- vomiting/diarrhoea
- reduced or excessive input and output in 24 hrs
- incomplete immunisation
- exposure to anyone else who is sick
- medication history/management.

	Assessment	Intervention
	Position	Position of comfort with carer
Airway	Assess patency	Maintain airway patency
Breathing	Respiratory rate and effort	Assist ventilation if required
	SpO_2	Apply O_2 to maintain SpO_2 > 94%
Circulation	Skin temperature Pulse – rate/volume	Indications of sepsis: refer to Sepsis guideline for ongoing management
	Capillary refill Colour Blood pressure	Signs of shock: tachycardia plus CR≥ 3 sec or abnormal skin perfusion or hypotension, give IV/IO 0.9% Sodium Chloride 20 mL/kg bolus
	Cardiac monitor	Monitor vital signs frequently
Disability	AVPU/GCS + pupils	Indication of Bacterial Meningitis refer to Guideline Monitor LOC frequently If GCS < 15 do BGL, monitor frequently and refer to altered consciousness and ROSC guideline
	Pain/Discomfort	Refer to Pain guideline
Measure and test	Temperature U/A (clean catch) Fluid input/output	Monitor vital signs frequently If fever unexplained do U/A and send for MCS Fluid balance chart
Specific treatment	Treat underlying cause of fever	
Document assessment findings, interventions and responses in the patient's healthcare record		

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Notes:

*Refer to sepsis guideline

**Refer to appropriate guideline for focus of infection

Medication Standing Orders

Always check for allergies and contraindications.

The weight of a child is mandatory for calculating drug and fluid doses prior to administration.

Drug	Dose	Route	Frequency
0.9% Sodium Chloride	20 mL/kg	IV/IO	Bolus

Further References and Resources

New South Wales. Agency for Clinical Innovation 2010, *Children and infants with fever: acute management*. NSW Health, Sydney.

Samuels, M, & Wieteska, S 2017, *Advanced paediatric life support: the practical approach*, 6th edn, John Wiley, Chichester.

FORMULARY

Adrenaline
Amiodarone Hydrochloride
Ampicillin Sodium
Benzylpenicillin Sodium
Budesonide (Pulmicort)
Ceftriaxone Sodium Cefotaxime
Sodium Dexamethasone
Fentanyl Gentamicin
Glucagon Hydrochloride 10%
Glucose
Hydrocortisone Sodium Succinate
Ipratropium Bromide
ALA/Laceraine™ Gel
Midazolam Morphine
Sulphate Naloxone
Ondansetron
Oxycodone
Paracetamol (oral)
Prednisolone
Salbutamol sulphate (Ventolin)
Vancomycin
0.9% Sodium Chloride

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Adrenaline

Drug Category: Parenteral adrenergic agents

Drug Name	Adrenaline
Indications/Doses	Anaphylactic reaction 10 micrograms/kg (0.01 mL/kg of 1:1,000) IM (maximum 0.5 mL) If symptoms not reversed, Adrenaline may be given every 5 minutes as needed. Auto-injector eg Epipen 10-20 kg 150 micrograms, >20 kg 300 micrograms IM nebulised undiluted Adrenaline 5 mL of 1:1,000 stat. Repeat after 30 minutes if required. 10 micrograms/kg (0.1 mL/kg of 1:10,000) IV/IO stat (consider if cardiopulmonary arrest) maximum 1mg or 10mL of 1:10,000 Cardiorespiratory Arrest (Advanced Life Support) 10 micrograms/kg (0.1 mL/kg of 1:10,000) IV/IO to a maximum dose of 1mg or 10mL of 1:10,000 every 4 minutes. Croup 5 mL (undiluted) nebulised 1:1000 as a single dose. Repeat after 30 minutes if required
Contraindications	Nil
Interactions	Sympathomimetics cause additive effects Beta blockers antagonise therapeutic effects of Adrenaline digitalis potentiates proarrhythmic effects of Adrenaline Tricyclic antidepressants Monoamine Oxidase Inhibitors potentiate cardiovascular effects of Adrenaline Phenothiazine causes a paradoxical decrease in blood pressure
Pregnancy	Category A Drugs which have been taken by a large number of pregnant women and women of childbearing age without any proven increase in the frequency of malformations or other direct or indirect harmful effects on the fetus having been observed Adrenaline may delay the second stage of labour by inhibiting contractions of the uterus
Precautions	Adverse effects include cardiac ischaemia or dysrhythmias, fear, anxiety, tremor, and hypertension with subarachnoid haemorrhage; use with caution in hypertension, cardiovascular disease, and cerebrovascular insufficiency; phenothiazines can cause a paradoxical decrease in blood pressure comment as above

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 20 January 2020.
- New South Wales. Agency for Clinical Innovation 2010, *Children and infants: acute management of croup*, NSW Health, Sydney.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 20 January 2020.

Amiodarone Hydrochloride

Drug Category: Antiarrhythmics

Drug Name	Amiodarone Hydrochloride
Indications/Doses	Cardiorespiratory Arrest (Advanced Life Support) 5 mg/kg/dose IV/IO (maximum 300 mg/dose) stat (Dilute with 5% Glucose)
Contraindications	Documented history of hypersensitivity; systemic lupus erythematosus, digitalis induced dysrhythmias, torsade de pointes, second or third degree heart block (without pacemaker) symptomatic bradycardia (without pacemaker) or sick sinus syndrome
Interactions	Increases effect and blood levels of theophylline, quinidine, procainamide, phenytoin, methotrexate, flecanide, digoxin, cyclosporine, beta-blockers and anti-coagulants; and disopyramide increases cardiotoxicity; co-administration with calcium channel blockers may cause additive effects, further decreasing myocardial contractility; cimetidine may increase amiodarone levels
Pregnancy	Category C Drugs that, owing to their pharmacological effects have caused or may be suspected of causing harmful effects on the human fetus or neonate without causing malformations, these effects may be reversible Avoid use 3 months before and during pregnancy; may cause thyroid dysfunction and bradycardia in the fetus
Precautions	Hypotension (most common adverse effect), bradycardia, and Atrio-Ventricular block may occur Phlebitis is an issue Incompatible with 0.9% Sodium Chloride Overly rapid administration can cause hypotension

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 20 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 20 January 2020.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 20 January 2020.

Ampicillin Sodium

Drug Category: Antibiotic

Drug Name	Ampicillin Sodium
Indications/Doses	Suspected Bacterial Meningitis Infants 0-3 months old 50-100 mg/kg IV/IO stat (maximum 2 g) per dose infuse slowly
Contraindications	History of hypersensitivity to beta-lactam antibiotics
Interactions	Gentamicin
Pregnancy	Category A Drugs which have been taken by a large number of pregnant women and women of childbearing age without any proven increase in the frequency of malformations or other direct or indirect harmful effects on the fetus having been observed
Precautions	Serious, and occasionally fatal, hypersensitivity reactions (anaphylaxis) have been reported in patients receiving beta-lactam antibiotics

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 20 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 20 January 2020.
- New South Wales. Agency for Clinical Innovation 2014, *Infants and children: acute management of bacterial meningitis: clinical practice guideline,* NSW Health, Sydney.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 20 January 2020.

Benzylpenicillin Sodium

Drug Category: Antibiotic

Drug Name	Benzylpenicillin Sodium
Indications/Doses	Suspected Bacterial Meningitis Infants 0-3 months old 60 mg/kg IV/IO stat (maximum 2.4 g) per dose infuse slowly
Contraindications	History of hypersensitivity reactions to beta-lactam antibiotics
Interactions	Intravenous solutions of benzylpenicillin are physically incompatible with many other substances including certain antihistamines, some other antibiotics, metaraminol tartrate, noradrenaline acid tartrate, thiopentone sodium and phenytoin sodium, may affect glucose in urinalysis
Pregnancy	Category A Drugs which have been taken by a large number of pregnant women and women of childbearing age without any proven increase in the frequency of malformations or other direct or indirect harmful effects on the fetus having been observed
Precautions	Serious, and occasionally fatal, hypersensitivity reactions (anaphylaxis) have been reported in patients receiving beta-lactam antibiotics

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 20 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 20 Jan 2020.
- New South Wales. Agency for Clinical Innovation 2014, *Infants and children: acute management of bacterial meningitis: clinical practice guideline,* NSW Health, Sydney.
- The Society of Hospital Pharmacists of Australia 2020, *Australian Injectable Drugs handbook*, 7th edn, viewed 20 January 2020.

Budesonide (Pulmicort)

Drug Category: Corticosteroids

Drug Name	Budesonide (Pulmicort)
Indications/Doses	Croup 2 mg (1 mg/2 mL nebules) undiluted nebulised stat
Contraindications	Known history of hypersensitivity to Budesonide
Interactions	Ketoconazole and Itraconazole can increase systemic exposure to budesonide. This is of limited clinical importance for short-term (one to two weeks) treatment with CYP3A inhibitors, but should be taken into consideration during long-term treatment
Pregnancy	Category A Drugs which have been taken by a large number of pregnant women and women of childbearing age without any proven increase in the frequency of malformations or other direct or indirect harmful effects on the fetus having been observed

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, accessed 21 January 2020.
- New South Wales. Agency for Clinical Innovation 2010, *Children and infants: acute management of croup*, NSW Health, Sydney.

Ceftriaxone Sodium

Drug Category: Antibiotic

Drug Name	Ceftriaxone Sodium
Indications/Doses	Suspected Bacterial meningitis Children ≥ 1 month old 50-100 mg/kg IV/IO stat (maximum 2 g) per dose
Contraindications	Allergy to cephalosporins
Interactions	Chloramphenicol. Ceftriaxone is incompatible with calcium; do not give via calcium containing solutions i.e. do not mix with Hartmann's, Vancomycin or Gentamicin
Pregnancy	Category B1 Drugs that have been taken by only a limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on the human fetus having been observed Studies in animals [1] have not shown evidence of an increased occurrence of fetal damage
Precautions	Renal, hepatic impairment, vitamin K synthesis, prolonged use, history of GI disease (esp. colitis); pregnancy, lactation

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 Jan 2020.
- New South Wales. Agency for Clinical Innovation 2014, *Infants and children: acute management of bacterial meningitis: clinical practice guideline*, NSW Health, Sydney.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 20 January 2020.

Cefotaxime Sodium

Drug Category: Cephalosporin

Drug Name	Cefotaxime Sodium
Indications/Doses	Sepsis 50 mg/kg IV/IO stat (maximum 2 g) per dose (slow push over 3-5 minutes) Suspected Bacterial meningitis 50 mg/kg IV/IO stat (maximum 2 g) per dose (slow push over 3-5 minutes)
Contraindications	Known hypersensitivity to Cefotaxime or other cephalosporin antibiotics
Interactions	Gentamicin
Pregnancy	Category B1 Drugs that have been taken by only a limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on the human fetus having been observed Studies in animals [1] have not shown evidence of an increased occurrence of fetal damage
Precautions	Arrhythmia

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 Jan 2020.
- New South Wales. Agency for Clinical Innovation 2014, *Infants and children: acute management of bacterial meningitis: clinical practice guideline*, NSW Health, Sydney.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 20 January 2020.

Dexamethasone

Drug Category: Systemic Corticosteroids

Drug Name	Dexamethasone
Indications/Doses	Croup 0.3 mg/kg (maximum dose 10 mg) oral stat Suspected Bacterial Meningitis in children > 2 months of age 0.15 mg/kg (maximum dose 10 mg) IV/IO stat
Contraindications	Uncontrolled infections. Known hypersensitivity to dexamethasone
Interactions	Rifampicin, phenytoin and barbiturates may reduce the plasma levels and half-life of corticosteroids Oral contraception
Pregnancy	Category A Drugs which have been taken by a large number of pregnant women and women of childbearing age without any proven increase in the frequency of malformations or other direct or indirect harmful effects on the fetus having been observed
Precautions	Diabetes, Hepatic Impairment

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 January 2020.
- New South Wales. Agency for Clinical Innovation 2010, *Children and infants: acute management of croup*, NSW Health, Sydney.
- New South Wales. Agency for Clinical Innovation 2014, *Infants and children: acute management of bacterial meningitis: clinical practice guideline*, NSW Health, Sydney.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 20 January 2020.

Fentanyl

Drug Category: Opioid Analgesic

Drug Name	Fentanyl
Indications/Doses	Recognition of a sick child 1-18 years 1.5 micrograms/kg intranasal (maximum total dose 100 micrograms) Burns 1-18 years 1.5 micrograms/kg intranasal (maximum total dose 100 micrograms) Head injury 1-18 years 1.5 micrograms/kg intranasal (maximum total dose 100 micrograms) Abdominal pain 1-18 years 1.5 micrograms/kg intranasal (maximum total dose 100 micrograms) Pain – Any Cause 1-18 years 1.5 micrograms/kg intranasal (maximum total dose 100 micrograms)
Contraindications	Known hypersensitivity to opioid analgesics CNS depression Raised intra-cranial pressure, concomitant monoamine oxidase inhibitors Children < 10 kg Bleeding from the nose
Interactions	CNS depressants, monoamine oxidase inhibitors, benzodiazepines, other opioids, alcohol
Pregnancy	Category C Drugs that, owing to their pharmacological effects, have caused or may be suspected of causing harmful effects on the human fetus or neonate without causing malformations These effects may be reversible
Precautions	Respiratory depression, impaired renal or hepatic function, hypovolaemia

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 January 2020.
- The Royal Children's Hospital Melbourne 2020, *Clinical practice guideline: Intranasal fentanyl*, viewed 21 January 2020.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 21 January 2020.

Gentamicin

Drug Category: Aminoglycoside Antibiotic

Drug Name	Gentamicin
Indications/Doses	Sepsis: 1 month to 10 years of age: 7.5 mg/kg/dose, IV/IM/IO, 24 hourly Max dose 320 mg > 10 years of age: 6-7 mg/kg/dose, IV/IM/IO, 24 hourly Max dose 560 mg
Contraindications	History or family history of auditory toxicity caused by aminoglycosides, Myasthenia gravis History of sensitivity
Interactions	Gentamicin is inactivated by penicillins and cephalosporins and should not be mixed or given simultaneously Should be administered by separate infusion
Pregnancy	Category D Gentamicin is known to cross placenta Evidence of selective uptake by the fetal kidney resulting in cellular damage, thought to be reversible
Precautions	Renal impairment

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 Jan 2020.
- New South Wales. Clinical Excellence Commission 2017, *Safe gentamicin prescribing in paediatrics: taking the confusion and harm out of gentamicin dosing and monitoring*, NSW Health, Sydney.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 21 January 2020.

Glucagon Hydrochloride

Drug Category: Glucose-elevating Agents

Drug Name	Glucagon Hydrochloride
Indications/Doses	Recognition of the Sick Baby and Child If IV access unavailable: Children < 25 kg: 0.5 mg IM stat if BGL < 3 mmol/L Children ≥ 25 kg: 1 mg IM stat if BGL < 3 mmol/L Seizures If IV access unavailable: Children < 25 kg: 0.5 mg IM stat if BGL < 3 mmol/L Children ≥ 25 kg: 1 mg IM stat if BGL < 3 mmol/L Unconscious patient If IV access unavailable: Children < 25 kg: 0.5 mg IM stat if BGL < 3 mmol/L Children ≥ 25 kg: 1 mg IM stat if BGL < 3 mmol/L Bronchiolitis If IV access unavailable: Children < 25 kg: 0.5 mg IM stat if BGL < 3 mmol/L Children ≥ 25 kg: 1 mg IM stat if BGL < 3 mmol/L Gastroenteritis If IV access unavailable: Children < 25 kg: 0.5 mg IM stat if BGL < 3 mmol/L Children ≥ 25 kg: 1 mg IM stat if BGL < 3 mmol/L Sepsis If IV access unavailable: Children < 25 kg: 0.5 mg IM stat if BGL < 3 mmol/L Children ≥ 25 kg: 1 mg IM stat if BGL < 3 mmol/L Suspected bacterial meningitis If IV access unavailable: Children < 25 kg: 0.5 mg IM stat if BGL < 3 mmol/L Children ≥ 25 kg: 1 mg IM stat if BGL < 3 mmol/L Poisoning If IV access unavailable: Children < 25 kg: 0.5 mg IM stat if BGL < 3 mmol/L Children ≥ 25 kg: 1 mg IM stat if BGL < 3 mmol/L Drowning If IV access unavailable: Children < 25 kg: 0.5 mg IM stat if BGL < 3 mmol/L Children ≥ 25 kg: 1 mg IM stat if BGL < 3 mmol/L Head injury If IV access unavailable: Children < 25 kg: 0.5 mg IM stat if BGL < 3 mmol/L Children ≥ 25 kg: 1 mg IM stat if BGL < 3 mmol/L Abdominal pain If IV access unavailable: Children < 25 kg: 0.5 mg IM stat if BGL < 3 mmol/L Children ≥ 25 kg: 1 mg IM stat if BGL < 3 mmol/L
Contraindications	Documented hypersensitivity Phaeochromocytoma Insulinoma Glucagonoma
Interactions	Insulin Beta blockers May enhance the effects of anticoagulants

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Drug Name	Glucagon Hydrochloride
Pregnancy	Category B3 Drugs that have been taken by only a limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on the human fetus having been observed Studies in animals are inadequate or may be lacking, but available data show no evidence of an increased occurrence of fetal damage
Precautions	Glucagon will have little or no effect if patient is fasting or suffering from adrenal insufficiency, chronic hypoglycaemia or alcohol induced hypoglycaemia

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 January 2020.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 20 January 2020.

10% Glucose

Drug Category: Glucose-elevating Agents

Drug Name	10% Glucose
Indications/Doses	Bronchiolitis 2 mL/kg IV/IO stat if BGL < 3 mmol/L Sepsis 2 mL/kg IV/IO stat if BGL < 3 mmol/L Recognition of a sick baby or child 2 mL/kg IV/IO stat if BGL < 3 mmol/L Seizures 2 mL/kg IV/IO stat if BGL < 3 mmol/L Unconscious patient 2 mL/kg IV/IO stat if BGL < 3 mmol/L Gastroenteritis 2 mL/kg IV/IO stat if BGL < 3 mmol/L Suspected bacterial meningitis 2 mL/kg IV/IO stat if BGL < 3 mmol/L Poisoning 2 mL/kg IV/IO stat if BGL < 3 mmol/L Drowning 2 mL/kg IV/IO stat if BGL < 3 mmol/L Head injury 2 mL/kg IV/IO stat if BGL < 3 mmol/L Abdominal pain 2 mL/kg IV/IO stat if BGL < 3 mmol/L
Contraindications	Diabetic (hyperglycemic) coma, corn (maize) allergy
Interactions	Do not administer simultaneously with blood products via the same infusion line
Pregnancy	Category C Drugs that, owing to their pharmacological effects, have caused or may be suspected of causing harmful effects on the human fetus or neonate without causing malformations These effects may be reversible
Precautions	May cause nausea, monitor fluid balance, electrolyte concentrations, and acid-base balance closely. Glucose administration may produce vitamin B-complex deficiency Thrombophlebitis Fluid and/or solute overloading, serum electrolyte disturbance, over hydration, congested states, pulmonary oedema

Modified from:

- Children's Hospital Network 2020, *Meds4Kids dosing guide*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, accessed 21 January 2020.
- New South Wales. Agency for Clinical Innovation 2014, *Infants and children: management of acute gastroenteritis*, 4th edn, NSW Health, Sydney.
- New South Wales. Agency for Clinical Innovation 2011, *Infants and children: acute management of head injury*, NSW Health, Sydney.
- New South Wales. Agency for Clinical Innovation 2018, *Infants and children: acute management of seizures*, NSW Health, Sydney.
- The Royal Children's Hospital Melbourne 2020, *Clinical practice guideline: hypoglycaemia*, viewed 21 Jan 2020.

Hydrocortisone sodium succinate

Drug Category: Systemic Adrenal Steroid Hormones

Drug Name	Systemic Adrenal steroid hormones
Indications/Doses	Severe and life-threatening asthma 4 mg/kg IV/IO stat Acute Adrenal Insufficiency 2-4 mg/kg IV/IM Maximum dose 100 mg
Contraindications	Known hypersensitivity, systemic fungal infections, premature infants, live attenuated vaccines
Interactions	Thiazide diuretics may increase the risk of hyperglycaemia caused by hydrocortisone Rifampicin, phenytoin and barbiturates may reduce the plasma levels and half-life of corticosteroids Decreases the efficiency of the following medications; Aspirin, Insulin, oral anti-diabetic medication, oral contraceptive pill
Pregnancy	Category C Drugs that, owing to their pharmacological effects, have caused or may be suspected of causing harmful effects on the human fetus or neonate without causing malformations These effects may be reversible
Precautions	Cirrhosis or hypothyroidism may enhance the effect of corticosteroids

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 January 2020.
- New South Wales. Agency for Clinical Innovation 2012, *Infants and children: acute management of asthma*, NSW Health, Sydney.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 21 January 2020.

Ipratropium Bromide

Drug Category: Bronchodilator

Drug Name	Ipratropium Bromide (Atrovent)
Indications/Doses	Severe and life-threatening asthma 6 months- 6 yrs < 20 kg: 250 micrograms 3 x 20 minutely via nebuliser 6-18 yrs ≥ 20 kg: 500 micrograms 3 x 20 minutely via nebuliser
Contraindications	Documented hypersensitivity to ipratropium
Interactions	Drugs with anticholinergic properties may increase toxicity Cardiovascular effects may increase with Monoamine Oxidase Inhibitors, tricyclic antidepressants and sympathomimetic agents Disodium cromoglycate inhalation solutions containing benzalkonium chloride. Beta- Adrenergics and xanthine
Pregnancy	Category B1 Drugs that have been taken by only a limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on the human fetus having been observed Studies in animals have not shown evidence of an increased occurrence of fetal damage
Precautions	Caution in glaucoma (protect eyes if nebuliser in use), hyperthyroidism, diabetes mellitus, cardiovascular disorders and cystic fibrosis May cause bronchoconstriction in some patients with hyper reactive airways

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 January 2020.
- New South Wales. Agency for Clinical Innovation 2012, *Infants and children: acute management of asthma*, NSW Health, Sydney.

ALA/Laceraine™ Gel

Drug Category: Topical Wound Anaesthetic

Drug Name	Tetracaine (amethocaine) hydrochloride/lidocaine (lignocaine) hydrochloride/ adrenaline (epinephrine) acid tartrate
Indications/Doses	Pain – any cause Topical application to superficial local wounds and lacerations to provide local surface anaesthesia It may be used to provide topical anaesthetic relief for wound closure Tetracaine 0.5% + lidocaine 4% + adrenaline 0.1% (ALA or Laceraine) Children aged 1 to 3 years 0.1mL/kg to a maximum of 2mL Children 3 years to adult 0.1 mL/kg to a maximum of 3mL Wounds should not require volumes greater than the dose limits for lacerations less than 5cm in length OR 1mL for each cm of laceration, whichever is the lesser volume: Using a 3mL syringe draw up the dose through vial neck. Drop thick gel directly onto wound and spread over the wound surface. A cotton bud may be used. Cover with occlusive dressing and leave the occlusive dressing in place for a minimum of 20 minutes to a maximum of 60 minutes. Remove after 60 minutes. Clean and/or irrigate the wound ensuring all Laceraine® is removed prior to cleaning and repairing the wound. Onset of action 20 minutes, duration maximum 60 minutes.
Contraindications	Not to be used: Intact skin, burns, those with known hypersensitivity, bites It should not be used on wounds greater than 7 cm or where the wound is contaminated or complex Do not use Laceraine Topical Wound Anaesthetic on appendages such as digits, pinnae, tip of nose or penis Do not allow patients to rub area Not indicated for areas such as mucous membranes, the eyes, nose, throat or larynx It is not indicated for any dental use, or on any sites where there is possible entry to major veins or arteries
Interactions	Patients on non-selective beta-blockers such as Propranolol should not be treated with Laceraine®
Precautions	Care should be taken to ensure that any site should not be given more than four applications in a 24 hour period Care should be taken to ensure children do not transfer any Laceraine topical wound anaesthetic from the site of application to eyes, mouth or any other mucous membranes See product information for all precautions

Modified from:

- Phebra 2015, *Laceraine topical wound anaesthetic: product information*, viewed 21 January 2020.
- Therapeutic Guidelines 2018, *eTG complete: pain in children,* viewed 21 January 2020.
- Phebra 2020, Laceraine topical wound anaesthetic (gel): product information, viewed 3 March January 2021
- SCHN Procedure 2020, Laceraine topical wound anaesthetic: Application – ED Procedure, viewed 3 March 2021

Midazolam

Drug Category: Sedatives, Hypnotics

Drug Name	Midazolam hydrochloride
Indications/Doses	Seizures 0.3 mg/kg buccal/Intranasal stat (to a maximum dose of 10 mg) and repeat after 5 minutes if required (once only) 0.15 mg/kg IM/IV/IO stat (to a maximum of 5 mg) and repeat after 5 minutes if required (once only) Head injury (if seizures) 0.3 mg/kg buccal/Intranasal stat (to a maximum dose of 10 mg) and repeat after 5 minutes if required (once only) 0.15 mg/kg IM/IV/IO stat (to a maximum of 5 mg) and repeat after 5 minutes if required (once only) Suspected bacterial meningitis (if seizures) 0.3 mg/kg buccal/intranasal stat (to a maximum dose of 10 mg) and repeat after 5 minutes if required (once only) 0.15 mg/kg IM/IV/IO stat (to a maximum of 5 mg) and repeat after 5 minutes if required (once only) Poisoning (if seizures) 0.3 mg/kg buccal/Intranasal stat (to a maximum dose of 10 mg) and repeat after 5 minutes if required (once only) 0.15 mg/kg IM/IV/IO stat (to a maximum of 5 mg) and repeat after 5 minutes if required (once only)
Contraindications	Documented hypersensitivity; pre-existing hypotension
Interactions	The sedative effects of neuroleptic, tranquillizers, antidepressants, sleep inducing drugs, analgesics, anaesthetics, antipsychotics, anxiolytics, antiepileptic drugs and sedative antihistamines may be enhanced by the administration of midazolam Premedication, alcohol and barbiturates may increase the sedative effect of midazolam
Pregnancy	Category C Drugs that, owing to their pharmacological effects, have caused or may be suspected of causing harmful effects on the human fetus or neonate without causing malformations These effects may be reversible
Precautions	Respiratory depression, apnoea, cardiovascular depression and cardiac arrest Pharmacokinetics has not been established in children < 8 years and may differ from adults

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 January 2020.
- New South Wales. Agency for Clinical Innovation 2011, *Infants and children: acute management of head injury*, NSW Health, Sydney.
- New South Wales. Agency for Clinical Innovation 2014, *Infants and children: acute management of bacterial meningitis: clinical practice guideline*, NSW Health, Sydney.
- New South Wales. Agency for Clinical Innovation 2018, *Infants and children: acute management of seizures*, NSW Health, Sydney.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 21 January 2020.

Morphine Sulphate

Drug Category: Analgesics

Drug Name	Morphine Sulphate
Indications/Doses	Recognition of a sick child (if severe pain) 1-12 months 0.05 mg/kg: >12 months 0.05-0.1 mg/kg IV/IO. Repeat once in 5 minutes if necessary to a maximum dose of 1mg (1-12 months), or 10mg (1-18 years) Burns (if pain score 7-10) 1-12 months 0.05 mg/kg: >12 months 0.05-0.1 mg/kg IV/IO. Repeat once in 5 minutes if necessary to a maximum dose of 1mg (1-12 months), or 10mg (1-18 years). Head injury (if pain score7-10) 1-12 months 0.05 mg/kg: >12 months 0.05-0.1 mg/kg IV/IO. Repeat once in 5 minutes if necessary to a maximum dose of 1mg (1-12 months), or 10mg (1-18 years) Abdominal pain (if pain score7-10) 1-12 months 0.05 mg/kg: >12 months 0.05-0.1 mg/kg IV/IO. Repeat once in 5 minutes if necessary to a maximum dose of 1mg (1-12 months), or 10mg (1-18 years) Pain – Any Cause (if pain score 7-10) 1-12 months 0.05 mg/kg: >12 months 0.05-0.1 mg/kg IV/IO. Repeat once in 5 minutes if necessary to a maximum dose of 1mg (1-12 months), or 10mg (1-18 years)
Contraindications	Documented hypersensitivity, severe respiratory disease, coma
Interactions	Respiratory depressant and sedative effects may be additive toxicity in the presence of other medication
Pregnancy	Category C Drugs that, owing to their pharmacological effects, have caused or may be suspected of causing harmful effects on the human fetus or neonate without causing malformations These effects may be reversible
Precautions	Caution in hypotension, nausea, vomiting, supraventricular tachycardia Has vagolytic action and may increase ventricular response rate Caution in patients with severe renal, hepatic dysfunction, may cause excessive sedation or coma

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 January 2020.
- New South Wales. Agency for Clinical Innovation 2011, *Infants and children: acute management of head injury*, NSW Health, Sydney.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 21 January 2020.
- UpToDate 2019, *Evaluation and management of pain in children*, viewed 20 January 2020.

Naloxone

Drug Category: Sedatives, Hypnotics

Drug Name	Naloxone
Indications/Doses	Initial dose 10 micrograms/kg/dose (maximum 400 micrograms) Emergency with high clinical suspicion of overdose and unresponsive to initial dose 100 micrograms/kg/dose (maximum 2 mg) IV, IO, IM, subcutaneous, repeat as necessary Poisoning 100 micrograms/kg/dose (maximum 2 mg) IV, IO, IM, subcutaneous, repeat as necessary
Contraindications	Documented hypersensitivity, non-opioid respiratory depression
Interactions	Decreases analgesic effects of opioids Effects of partial agonists e.g. buprenorphine, tramadol only partially reversed by naloxone
Pregnancy	Category B1 Drugs that have been taken by only a limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on the human fetus having been observed Studies in animals have not shown evidence of an increased occurrence of fetal damage
Precautions	Caution in cardiovascular disease May precipitate withdrawal symptoms in patients with opiate dependence; if patients do not respond to multiple doses of naloxone, consider alternative cause of unconsciousness Reversal of opioid effects may unmask other toxicities in cases of ingestion of multiple agents and increase the risk of seizures Be cautious of administration to neonates whose mothers are known or suspected to be addicted to opioids, as it may cause an abrupt and complete reversal of opioid effect and acute withdrawal syndrome

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 January 2020.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 21 January 2020.

Ondansetron

Drug Category: Antiemetics

Drug Name	Ondansetron
Indications/Doses	Gastroenteritis > 6 months 8-15 kg 2 mg oral as a single dose ≥ 2 years: 15-30 kg 4 mg oral as a single dose > 30 kg: 8 mg oral as a single dose
Contraindications	Hypersensitivity to any component of the preparation
Interactions	May reduce the analgesic effect of tramadol Phenytoin, carbamazepine and rifampicin increase the oral clearance time and reduces the blood concentration of ondansetron Avoid the concomitant use of drugs that prolong the QT interval
Pregnancy	Category B1 Drugs that have been taken by only a limited number of pregnant women and women of childbearing age, without an increase in the frequency of malformation or other direct or indirect harmful effects on the human fetus having been observed Studies in animals have not shown evidence of an increased occurrence of fetal damage
Precautions	Subacute intestinal obstruction, not recommended in breast feeding

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 January 2020.
- New South Wales. Agency for Clinical Innovation 2014, *Infants and children: management of acute gastroenteritis*, 4th edn, NSW Health, Sydney.

Oxycodone

Drug Category: Narcotic Analgesic

Drug Name	Oxycodone
Indications/Doses	Recognition of a sick child Oral Oxycodone 1-12 months, oral 0.05mg/kg (max 0.6mg) stat 1-18 years, oral 0.1mg/kg (max 5mg) stat Burns Oral Oxycodone 1-12 months, oral 0.05mg/kg (max 0.6mg) stat 1-18 years, oral 0.1mg/kg (max 5mg) stat Head injury Oral Oxycodone 1-12 months, oral 0.05mg/kg (max 0.6mg) stat 1-18 years, oral 0.1mg/kg (max 5mg) stat Abdominal pain Oral Oxycodone 1-12 months, oral 0.05mg/kg (max 0.6mg) stat 1-18 years, oral 0.1mg/kg (max 5mg) stat Pain – any cause Oral Oxycodone 1-12 months, oral 0.05mg/kg (max 0.6mg) stat 1-18 years, oral 0.1mg/kg (max 5mg) stat
Contraindications	Known hypersensitivity to opioid analgesics CNS depression Respiratory depression, Raised intra cranial pressure, Concomitant monoamine oxidase inhibitors Children < 1 year old
Interactions	CNS depressants, monoamine oxidase inhibitors
Pregnancy	Category C Drugs which, owing to their pharmacological effects, have caused or may be suspected of causing, harmful effects on the human fetus or neonate without causing malformations These effects may be reversible
Precautions	Respiratory depression, hypotension, hypovolaemia, impaired renal or hepatic function Caution in cardiovascular disease May precipitate withdrawal symptoms in patients with opiate dependence If patients do not respond to multiple doses of naloxone, consider alternative cause of unconsciousness Reversal of opioid effects may unmask other toxicities in cases of ingestion of multiple agents and increase the risk of seizures Be cautious of administration to neonates whose mothers are known or suspected to be addicted to opioids, as it may cause an abrupt and complete reversal of opioid effect and acute withdrawal syndrome

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 January 2020.

Paracetamol (oral)

Drug Category: Analgesic and Antipyretic

Drug Name	Paracetamol (oral)
Indications/Doses	Recognition of the sick child Dose is recommended for patients of normal or average build; if not nil by mouth 15 mg/kg/dose Oral 4th hourly to a maximum of 60 mg/kg/day Single dose never to exceed 1 g and no more than 4 g in 24 hours Burns Dose is recommended for patients of normal or average build; if not nil by mouth 15 mg/kg/dose Oral 4th hourly to a maximum of 60 mg/kg/day Single dose never to exceed 1 g and no more than 4 g in 24 hours Head injury Dose is recommended for patients of normal or average build; if not nil by mouth 15 mg/kg/dose Oral 4th hourly to a maximum of 60 mg/kg/day Single dose never to exceed 1 g and no more than 4 g in 24 hours Abdominal pain Dose is recommended for patients of normal or average build; if not nil by mouth 15 mg/kg/dose Oral 4th hourly to a maximum of 60 mg/kg/day Single dose never to exceed 1 g and no more than 4 g in 24 hours Pain – any Cause Dose is recommended for patients of normal or average build; if not nil by mouth 15 mg/kg/dose Oral 4th hourly to a maximum of 60 mg/kg/day Single dose never to exceed 1 gram and no more than 4 gram in 24 hours
Contraindications	Documented hypersensitivity, patient is nil by mouth
Interactions	Anticoagulants, drugs affecting gastric emptying, hepatic enzyme inducers including alcohol, anticonvulsants
Pregnancy	Category A Drugs which have been taken by a large number of pregnant women and women of childbearing age without any proven increase in the frequency of malformations or other direct or indirect harmful effects on the fetus having been observed
Precautions	Prior to administration determine recent administration of any medicines containing Paracetamol. Caution in severe renal or hepatic dysfunction

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 6 August 2018.
- New South Wales. Agency for Clinical Innovation 2011, *Infants and children: acute management of head injury*, NSW Health, Sydney.
- New South Wales. Agency for Clinical Innovation 2013, *Infants and children: acute management of abdominal pain*, NSW Health, Sydney.
- New South Wales, Clinical Excellence Commission 2019, *High-risk medicines management policy*, NSW Health, Sydney.

Prednisolone

Drug Category: Systemic Corticosteroid

Drug Name	Prednisolone
Indications/Doses	Asthma–Mild 1 mg/kg oral stat (Maximum dose 50mg)-if prolonged episode or a history of severe asthma Asthma – Moderate 1 mg/kg oral stat (Maximum dose 50mg) Asthma – Severe 1 mg/kg oral stat (Maximum dose 50mg)-if tolerated orally Croup 1mg/kg oral stat (Maximum dose 60mg)-if tolerated orally and Dexamethasone unavailable
Contraindications	Documented hypersensitivity to Prednisone, Tuberculosis, systemic fungal infection
Interactions	Live vaccines (should not use), alcohol, antacids, antidiabetics, diuretics, hepatic enzyme inducers (e.g. phenytoin and rifampicin), cyclosporine, ketoconazole, anticoagulants
Pregnancy	Category A Drugs which have been taken by a large number of pregnant women and women of childbearing age without any proven increase in the frequency of malformations or other direct or indirect harmful effects on the fetus having been observed
Precautions	Patients who are immunosuppressed, live vaccines

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 January 2020.
- National Asthma Council Australia 2019, *Australian asthma handbook*, Version 2.0. The Council, South Melbourne.
- New South Wales. Agency for Clinical Innovation 2010, *Children and infants: acute management of croup*, NSW Health, Sydney.
- New South Wales. Agency for Clinical Innovation 2012, *Infants and children: acute management of asthma*, NSW Health, Sydney.

Salbutamol sulphate (Ventolin)

Drug Category: Bronchodilator

Drug Name	Salbutamol sulphate (Ventolin)
Indications/Doses	Anaphylactic reaction Metered dose inhaler + spacer Child 1-5 years; 6 puffs of 100 microgram Metered Dose Inhaler + spacer stat if wheeze present Child ≥ 6 years; 12 puffs of 100 microgram Metered Dose Inhaler + spacer stat if wheeze present Nebuliser Child 1-5 years; 2.5 mg nebule stat (if patients cannot inhale adequately to use an MDI and spacer or requires oxygen therapy) Child ≥ 6 years; 5 mg nebule stat (if patients cannot inhale adequately to use an MDI and spacer or requires oxygen therapy) Asthma Mild/Moderate – Metered Dose Inhaler + spacer Child 1-5 years; 6 puffs of 100 microgram Metered Dose Inhaler + spacer stat Child ≥ 6 years; 12 puffs of 100 microgram Metered Dose Inhaler + spacer stat Reassess severity after 10 minutes and repeat as needed Severe – Metered Dose Inhaler + spacer Child 1-5 years; 6 puffs of 100 micrograms Metered Dose Inhaler + spacer repeat every 20 minutes Child ≥ 6 years; 12 puffs of 100 micrograms Metered Dose Inhaler + spacer repeat every 20 minutes Severe – Nebuliser Child 1-5 years; 2.5 mg nebule repeat every 20 minutes (if patients cannot inhale adequately to use an MDI and spacer or requires oxygen therapy) Child ≥ 6 years; 5 mg nebule repeat every 20 minutes (if patients cannot inhale adequately to use an MDI and spacer or require oxygen therapy) Life-threatening – Continuous nebuliser Child 1-5 years: 2 x 2.5 mg nebules Child ≥ 6 years: 2 x 5 mg nebules Continuous nebuliser with a minimum flow rate of 8 litres per minute. Continuous until breathing difficulty improves Drowning Metered Dose Inhaler + spacer Child 1-5 years; 6 puffs of 100 microgram Child ≥ 6 years; 12 puffs of 100 microgram Nebuliser Child 1-5 years; 2.5 mg nebule stat (if patients cannot inhale adequately to use an MDI and spacer, or require oxygen therapy) Child ≥ 6 years; 5 mg nebule stat (if patients cannot inhale adequately to use an MDI and spacer, or require oxygen therapy)
Contraindications	History of hypersensitivity; can cause paradoxical bronchospasm; allergic reactions
Interactions	Beta Blockers; may increase cardiovascular effects of other sympathomimetics
Pregnancy	Category B1 Drugs which have been taken by a large number of pregnant women and women of childbearing age without any proven increase in the frequency of malformations or other direct or indirect harmful effects on the fetus having been observed
Precautions	May cause tachycardia, nausea and tremors Caution in patients with co-existing cardiovascular disease Hypokalaemia can occur with high dose particularly in combination with other potassium depleting medications

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 January 2020.
- New South Wales. Agency for Clinical Innovation 2012, *Infants and children: acute management of asthma*, NSW Health, Sydney.

Vancomycin

Drug Category: Antibiotic

Drug Name	Vancomycin
Indications/Doses	Serious Gram-positive bacterial infections (including MRSA) SEVERE SEPSIS (COMMUNITY OR HEALTHCARE-ASSOCIATED) DUE TO UNKNOWN SOURCE Powdered vial 500 mg, 1 g 500 mg vial: Add 10 mL water for injection = 50 mg/mL 1 g vial: Add 20 mL water for injection = 50 mg/mL 25 mg/kg actual body weight up to (maximum 750mg) Intermittent IV Infusion: Dilute to a maximum of 5 mg/mL and infuse over 60 minutes Maximum rate: 10 mg/minute for doses over 500 mg Fluid restricted patients: maximum concentration of 10 mg/mL via a central venous line If symptoms of 'red man syndrome' occur, extend the infusion time to 120 minutes or more
Contraindications	In patients with a known hypersensitivity to this drug
Interactions	Other neuro/ nephro/ ototoxic drugs (e.g. aminoglycosides), cholestyramine (oral admin), anaesthetics, diuretics (e.g. ethacrynic acid, frusemide), neutropenic drugs, neuromuscular blockers; incompatible with beta-lactams, admix with other compounds
Pregnancy	Category B2 Limited information Only if clearly needed
Precautions	Do NOT give as a bolus IV injection, intramuscularly or subcutaneously Avoid extravasation Rapid infusion (< 60 minutes) may cause 'red man syndrome' with flushing or rash, and rarely hypotension requiring the infusion to be slowed and close monitoring Caution: cross sensitivity may occur in patients with a history of hypersensitivity to teicoplanin Monitor serum trough levels for ongoing doses See product information for all precautions

Modified from:

- Australian Medicines Handbook 2020, *AMH children's dosing companion*, viewed 21 January 2020.
- MIMS Australia Pty Ltd 2015, *DBLVancomycin Hydrochloride for Intravenous Infusion: product information* viewed 21 January 2020.
- MIMS Australia Pty Ltd, *MIMS Online*, viewed 21 January 2020.
- Therapeutic Guidelines Limited 2019, *Prescribing vancomycin for neonates and children*, viewed 20 February 2020.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 21 January 2020.

0.9% Sodium Chloride

Drug Category: Intravenous Fluids

Drug Name	0.9% Sodium Chloride
Indications/Doses	IV/IO Cannula Flush – 2 mL Medication dilution – as per medication protocol. Indications/doses for the following conditions: Recognition of a sick child IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged cap refill or mottled skin, capillary refill ≥ 2 seconds (centrally) Anaphylactic reaction IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged cap refill or mottled skin, capillary refill > 2 seconds (centrally) Seizures IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged cap refill or mottled skin, capillary refill > 2 seconds (centrally) Unconscious patient IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged cap refill or mottled skin, capillary refill > 2 seconds (centrally) Cardiorespiratory arrest – Advanced Life Support IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged cap refill or mottled skin, capillary refill > 2 seconds (centrally) Gastroenteritis IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged cap refill or mottled skin, capillary refill > 2 seconds (centrally) Suspected bacterial meningitis IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged cap refill or mottled skin, capillary refill > 2 seconds (centrally) Poisoning IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged cap refill or mottled skin, capillary refill > 2 seconds (centrally) Snake/spider bite IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged cap refill or mottled skin, capillary refill > 2 seconds (centrally) Burns IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged cap refill or mottled skin, capillary refill > 2 seconds (centrally) Drowning IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged cap refill or mottled skin, capillary refill > 2 seconds (centrally) Head injury IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged cap refill or mottled skin, capillary refill > 2 seconds (centrally) Abdominal pain IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged capillary refill or mottled skin, capillary refill > 2 seconds (centrally) Febrile neutropaenia CVAD/IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged cap refill or mottled skin, capillary refill > 2 seconds (centrally) Fever IV/IO 20 mL/kg bolus if shocked: tachycardic, bradycardic, hypotensive, prolonged capillary refill or mottled skin, capillary refill > 2 seconds (centrally)

Drug Name	0.9% Sodium Chloride
Contraindications	
Interactions	Incompatible with Amiodarone
Pregnancy	Category A Drugs which have been taken by a large number of pregnant women and women of childbearing age without any proven increase in the frequency of malformations or other direct or indirect harmful effects on the fetus having been observed
Precautions	Congestive cardiac failure, severe renal impairment, sodium retention Do not use if the solution is not clear

Modified from:

- MIMS Australia Pty Ltd, *MIMS Online*, viewed 22 January 2020.
- New South Wales. Agency for Clinical Innovation 2010, *Children and infants: acute management of croup*, NSW Health, Sydney.
- New South Wales. Agency for Clinical Innovation 2014, *Infants and children: management of acute gastroenteritis*, 4th edn, NSW Health, Sydney.
- New South Wales. Agency for Clinical Innovation 2014, *Infants and children: acute management of bacterial meningitis: clinical practice guideline*, NSW Health, Sydney.
- New South Wales. Agency for Clinical Innovation 2015, *Standards for paediatric intravenous fluids: NSW Health*, 2nd edn, NSW Health, Sydney.
- New South Wales. Agency for Clinical Innovation 2018, *Infants and children: acute management of seizures*, NSW Health, Sydney.
- The Society of Hospital Pharmacists of Australia 2020, *Australian injectable drugs handbook*, 7th edn, viewed 22 January 20.

APPENDICES

Appendix One: Recommended Paediatric Broselow™ Trolley Checklist (2018 Version 6.1)

DATE:				
Side of Trolley				
Self-inflating BVM : 'infant' with clear face mask				
Self-inflating BVM : 'child' with size 2 clear face mask				
Self-inflating BVM : 'adult' with size 4-5 clear face mask				
Portable oxygen cylinder with flow meter and tap attached to side				
Suction available with tubing and paediatric yankeur sucker				
Sharps Bin				
Paediatric stethoscope				
Broselow™ Paediatric Emergency Tape				
On top of trolley				
Advanced life support resuscitation charts/algorithms				
Defibrillator or known location of Defibrillator				
Top Grey Drawer 1				
Drug dosage handbooks e.g. Frank Shann Drug Doses (2017) Monash-Paediatric Emergency Medication book				
Pharmacy pack – see Recommended Resuscitation Medication List				
Drug labels				
Calculator				
Laryngoscope handle				
Laryngoscope blades straight size 0,1,2,3 curved sizes 1,2,3				
Manometer required for all cuffed ETTs				
Magill's forceps – neonatal and paediatric				
ETT Introducers size small & medium				
Lubricating jelly				
Adhesive tape – ½ inch and 1 inch brown leukoplast tape				
Trache tape – 1 metre length				
Paediatric Colorimetric CO_2 detector 1kg-15kg, Adult Colorimetric CO_2 detector >15kg				
Hydrocolloid Dressing – 1 sheet				
Pen torch				
Tongue Depressor x 1				

- Site dependant* or optional if immediately available in department.
- **Please seal packs –1st due expiry date to be written on outside of sealed pack.**
- **If trolley sealed checking to be done weekly.**

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Scissors				
pH indicator strips (0.5 increments)				
Bottom Drawer				
Needle Thoracocentesis Pack: 14, 16 Gauge Cannulae, 3 way tap, 20mL syringe, Op site x 2, Alco wipes				
ECG dots				
5% Glucose 250mL x1				
10% Glucose 1L x 1				
0.9% Sodium Chloride 1L x 1				
Burette/pump giving set x 1				
Transfusion pump set x 1				
Syringes – Luer lock 50mL x 2				
3 way tap x 2				
Drawing up Needles (blunt 18g) x 20				
Batteries for laryngoscopes. Spare AA and C batteries				
Oxygen saturation probes – infant and child				
Tourniquet				
Defibrillation pads – paediatric size and adult size x 1 each				
Intraosseous pack (sealed)				
Alcohol swabs x 6				
Intraosseous needle or EZ IO Drill and paediatric size needles (pink x2 and blue x2), Adult needles (yellow) x2				
3 way tap x 1				
Syringes 50mL (Luer lock) x 1				
Syringe 20mL (Luer lock) x1				
Syringes 5mL (Luer lock) x1				
Drawer 2 Pink/Red Infant < 10kg				
Endotracheal tube pack (sealed)				
ETT uncuffed x 1 each sizes 2.5, 3.0, 3.5, 4.0				
Paediatric Cuffed ETT 3.0, 3.5				
Suction catheters – 6 FG x1, 8 FG x1				
Loose in pink/red drawer				
Clear face masks 00, 0, 1				
Oropharyngeal airway 00 & 0 (40mm – 60mm)				
Tongue depressor				
LMA Supreme/i-gel® size 1 & 1.5				
Suction Catheter size 6FG x 1, 8FG x1				
Umbilical Catheter Placement kit				
Umbilical catheter single lumen 3.5 FG				
IV cannulation pack (sealed)				
22G, 24G cannulae x 1 each				
Extension tube x 1				

- Site dependant* or optional if immediately available in department.
- **Please seal packs –1st due expiry date to be written on outside of sealed pack.**
- **If trolley sealed checking to be done weekly.**

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Paediatric Tegaderm IV starter pack				
Alcohol wipes x 2				
3 way tap x 2				
Syringes 3mL, 5mL x 1each				
0.9% Sodium Chloride 10mL x 1				
Neonatal arm board x 1, Infant arm board x1				
Oro/Nasogastric insertion pack (sealed)				
8FG gastric tube				
20mL syringe				
Free drainage bag/ container				
Drawer 3 Purple Small child 10-11kg				
Endotracheal tube pack (sealed)				
ETT uncuffed tubes sizes 4.0 x 1				
Paediatric Cuffed ETT 3.5				
Suction catheter 6FG x1, 8FG x 1				
Loose in purple drawer				
Clear face mask 2				
Oropharyngeal airway 1 (70mm)				
Tongue depressor				
LMA Supreme/i-gel® size 2				
Suction Catheter size 6FG x 1, 8FG x 1				
IV cannulation pack (sealed)				
22G, 24G cannulae x 1 each				
Extension tube x 2				
Paediatric Tegaderm IV starter pack				
Syringes 3mL, 5mL & 10mL x 1 each				
0.9% Sodium Chloride amp 10mL x 1				
3 way tap x 1				
Infant arm board x 1				
Oro/Nasogastric insertion pack (sealed)				
8FG gastric tube				
20 mL syringe				
Free drainage bag/ container				
Drawer 4 Yellow 12-15kg				
Endotracheal tube pack (sealed)				
ETT uncuffed sizes 4.5 x 1				
Paediatric Cuffed ETT 4.0				
Suction catheter 8FG x 1				
Loose in Drawer				
Clear Face mask 2				
Oropharyngeal airway size 1 (70mm)				

- Site dependant* or optional if immediately available in department.
- **Please seal packs –1st due expiry date to be written on outside of sealed pack.**
- **If trolley sealed checking to be done weekly.**

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

Tongue depressor				
LMA Supreme/i-gel® size 2				
Suction Catheter size 8FG x 1				
IV Cannulation pack (sealed)				
24G, 22G, 20G Cannula x 1each				
Extension tube x 1				
Paediatric Tegaderm IV starter pack				
Syringes 3mL, 5mL, 10mL x 1 each				
0.9% Sodium Chloride 10mL amp x 1				
3 way tap x 1				
Infant arm board x1, Paediatric arm board x 1				
Oro/Nasogastric insertion pack (sealed)				
10FG gastric tube				
50mL catheter tip syringe				
Free drainage bag/ container				
Drawer 5 White 16-18kg				
Endotracheal tube pack (sealed)				
Paediatric ETT cuffed tubes sizes 4.5				
Suction catheter 8FG x 1				
Loose in drawer				
Oropharyngeal airway sizes 1 (70mm)				
Clear face masks 2, 3				
Tongue depressor				
LMA Supreme/i-gel® size 2				
Suction Catheter size 8FG x 1, 10FG x 1				
IV Cannulation pack (sealed)				
22G, 20G, 18G cannula x 1				
Extension tube x 1				
Paediatric Tegaderm IV starter pack				
Syringes 3mL, 5mL, 10mL x 1 each				
0.9% Sodium Chloride 10mL amp x 1				
3 way tap x 1				
Paediatric arm board x 1				
Oro/Nasogastric insertion pack (sealed)				
10 FG gastric tube				
50mL catheter tip syringe				
Free drainage bag/ container				
Drawer 6 Blue 19-23kg				
Endotracheal tube pack (sealed)				
Paediatric ETT cuffed tubes size 5.0, 5.5				
Suction catheter 10FG x 1				
Syringe 10mL x 1				

- Site dependant* or optional if immediately available in department.
- **Please seal packs –1st due expiry date to be written on outside of sealed pack.**
- **If trolley sealed checking to be done weekly.**

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Loose in drawer				
Clear face masks sizes 2 and 3				
Oropharyngeal airway size 2 (80-90mm)				
Tongue depressor				
LMA Supreme/i-gel® size 2.5				
Suction Catheter size 8FG x 1, 10FG x 1				
IV cannulation pack (sealed)				
22G, 20G, 18G cannula x 1 each				
Paediatric Tegaderm IV starter pack				
Syringes 3mL , 5mL, 10mL x 1 each				
0.9% Sodium Chloride 10mL amp x 1				
3 way tap x 1				
Extension tube x 1				
Paediatric arm board x 1				
Oro/Nasogastric insertion pack (sealed)				
10 FG gastric tube				
50mL catheter tip syringe				
Free drainage bag/ container				
Drawer 7 Orange small adult 24-28kg				
Endotracheal tube pack (sealed)				
Paediatric ETT cuffed tube size 5.5, 6.0				
Suction catheter 10FG				
Syringe 10mL x 1				
Loose in drawer				
Clear face mask size 3				
Oropharyngeal airway size 3 (80-90mm)				
Tongue depressor				
LMA Supreme size/i-gel® 2.5				
Suction Catheter size 10FG x 1, 12FG x1				
IV Cannulation pack (sealed)				
22G, 20G, 18G cannula x 1 each				
Extension tube x 1				
Tegaderm IV starter pack				
Syringes 3mL, 5mL, 10mL x 1 each				
0.9% Sodium Chloride 10mL amp x 1				
3 way tap x 1				
Paediatric arm board x 1				
Oro/Nasogastric insertion pack (sealed)				
12, 14FG gastric tube				
Syringe 50mL catheter tip				
Free drainage bag/ container				

- Site dependant* or optional if immediately available in department.
- **Please seal packs –1st due expiry date to be written on outside of sealed pack.**
- **If trolley sealed checking to be done weekly.**

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Drawer 8 Green 30-40kg small adult				
ETT cuffed tube size 6.5, 7.0				
Suction catheter 12G x 1				
Syringe 10mL x 1				
Loose in drawer				
Clear face mask size 4				
Oropharyngeal Airway sizes 3 (80-90mm)				
Tongue depressor				
LMA Supreme /i-gel®size 3				
Suction Catheter size 12FG x1				
IV cannulation pack (sealed)				
20G, 18G, 16G cannula x 1each				
Extension tube x 1				
Tegaderm IV starter pack				
Syringes 3mL, 5mL, 10mL x 1 each				
0.9% Sodium Chloride 10mL amp x 1				
3 way tap x 1				
Paediatric arm board x1, adult arm board x 1				
Oro/Nasogastric insertion pack (sealed)				
12, 14FG gastric tube				
Syringe 50 mL catheter tip				
Free drainage bag/ container				
Initials				
Actions				

- *Site dependant* or optional if immediately available in department
- Please seal packs –1st due expiry date to be written on outside of sealed pack.
- If trolley sealed checking to be done weekly.

ALERT:

If using Paediatric Cuffed ETT use a 3mL syringe to inflate the cuff to the safe range 5-15cm H2O with minimal air leak.

Do not use the bulb of the manometer to inflate the cuff. This can cause the cuff to over-inflate.

References:

- NETS 2015, Cuffed endotracheal and tracheostomy tubes: management - NETS: procedure, viewed 22 January 2020.
- Kimberly Clarke 2006, Microcuff Paediatric EndotrachealTube, viewed 22 January 2020.
- Fine,G,Maxwell,L,&Gerber,A 2008,NewAdvancesinPaediatricVentilation:RevolutionizingtheManagementof Pediatric Intubation with CuffedTubes. Kimberly-Clark Healthcare, Adair Greene McCann.
- New South Wales. Agency for Clinical Innovation 2016,*Infants and children insertion and confirmation of placement of nasogastric and orogastric tubes*, NSW Health, Sydney.
- NSW Children's Health Care Network Paediatric Clinical Nurse Consultants 2018, Broselow Trolley – Recommend Equipment, Available above in Appendix 1.

Note:

- LMA sizes are based on the Supreme™ brand from Teleflex Medical, and the i-gel® brand from © IntersurgicalAustralia Pty Ltd
- Cuffed ETT sizes are based on Halyard Microcuff Paediatric Endotracheal Tube Sizing Chart,
- Umbilical catheter placement kit and umbilical catheter as recommended by NETS- (Vygon brand).

Drug books:

- Frank Shann 2017, Drug doses, 17th edn, JR Medical books, Reservoir, Victoria.
- Monash Children's Hospital Resuscitation Committee 2018, Paediatric emergency medication book, 2nd edn, Monash, Victoria.

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Appendix Two: Facility Checklist of Minimum Paediatric Equipment and Resources

Clearly visible in clinical area	Available in triage/resus/ward area (not required to be immediately visible)	Available in Facility (not required to be immediately available in ED)

Resources	Location	Alignment National Standards
Paediatric Resuscitation Card (current version updated 4th yearly)	RED	4, 9
Paediatric Advanced Life Support Algorithm	RED	9
Paediatric Choking Child Algorithm	RED	9
COACHED Algorithm	RED	9
Paediatric CERS Flow Chart	RED	9
Critical Care/NETS contact numbers	RED	1, 9
Paediatric Rural Emergency Clinical Guidelines (Rural Sites only)	RED	1, 4, 9
Paediatric Clinical Practice Guideline 1 page flowcharts	RED	1, 9
Paediatric Sepsis ED & Inpatient Pathways	RED	1, 4, 9
Paediatric Drug Dosing Book, example: Frank Shann	RED	1, 4
Pain assessment tools	RED	1, 9
Sepsis First Dose Antibiotic Guidelines Neonates and Paediatrics	YELLOW	1, 4
Management of Children with Surgical Problems in ED Template	YELLOW	1, 4, 9
IV Fluids Poster/Standards Document	YELLOW	4
Keep Them Safe Mandatory Reporting Guide Child Protection local pathway	YELLOW	1
Burns Poster (NSW Burns Service)	YELLOW	1, 3, 4, 9
Intraosseous poster and Pocket guide (Vidacare A3)	YELLOW	1, 4, 9
SUDI Folder	YELLOW	1, 9
Falls Risk Posters & Checklist	BLUE	10
DETECT Junior Manual	BLUE	1, 9
Paediatric Sepsis Toolkit: data collection, implementation	BLUE	4, 9
Forms		
PEDOC/SPOC/EMR forms in 5 age groups	YELLOW	1, 9
Paediatric IV Fluid Order & Fluid Balance chart	YELLOW	4, 9
Paediatric Risk Assessment Form (Inpatient unit only)	YELLOW	2, 3, 4, 5, 6, 9
Paediatric Neurological Chart	YELLOW	9
LHD endorsed Falls Assessment tool	YELLOW	9
Paediatric National Inpatient Medication Chart: P-NIMC	YELLOW	4
Equipment – Resuscitation		
Paediatric Resuscitation Trolley, Trolley Checklist & Drug List example: Broselow™ Trolley	RED	1, 9

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Resources	Location	Alignment National Standards
Equipment – Airway		
As per Broselow™ Trolley Checklist	RED	1, 9 Equipment – Breathing
Infant resuscitator example Neopuff™ (if desired by LHD)	RED	9
Nasal prongs neonatal/infant/paediatric and adult sizes	RED	9
Hudson masks infant/child/adult	RED	9
Nebuliser masks infant/child	RED	9
Partial non-rebreather mask infant/child	RED	9
Pulse Oximeter with probe	RED	9
Spacers low volume	YELLOW	9
Equipment – Circulation		
Intraosseous Kit & intraosseous needles 15 mm, 25 mm, 45 mm	RED	1, 9
Manual BP Cuffs	YELLOW	1, 9
• Small infant 7-10 cm		
• Infant 9-13 cm		
• Small Child 12-16 cm		
• Child 15-21 cm		
• Small Adult 20 cm +		
Automatic BP Cuffs	YELLOW	1, 9
• BP Cuffs Small Adult 106 mm		
• BP Cuffs Paediatric 80 mm		
• BP Cuffs Infant 55 mm		
Blood Collection tubes + Guide	YELLOW	1, 9
• Culture		
• Blood gas		
• Green top		
• Yellow top		
• Red top		
Equipment – Disability		
Cervical collars – Paediatric sizes	RED	9
Equipment – Monitoring		
Thermometer (axillary)	YELLOW	1, 9
Cardiorespiratory Monitor with paediatric equipment	YELLOW	9
Baby Scales	YELLOW	1
Universal pH strips	YELLOW	1
Urine bags or IDC for Level 3 & above	YELLOW	9
Paediatric Burette	YELLOW	9
IV Pump	YELLOW	9

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Resources	Location	Alignment National Standards
Paediatric extension tube & tegaderm or paediatric IV starter kit	YELLOW	9
Paediatric arm boards	YELLOW	9
Miscellaneous		
Nappies	BLUE	9
Distraction Box (Facility dependent)	BLUE	1, 2

Resources to be used in consultation with this appendix:

- NSW Children's Health Care Network Paediatric Clinical Nurse Consultants 2018, Broselow Trolley – Recommend equipment, available in Appendix 1.
- NSW Health 2014, *Surgery for Children in Metropolitan Sydney: Strategic Framework*, two page flowchart or Rural LHD locally adapted guideline.
- The facility checklist incorporates the checklist from *Children and Adolescents – Admission to Services Designated Level 1-3 Paediatric Medicine & Surgery*, appendix 4: Equipment requirements in designated Level 1-3.

Appendix Three: Paediatric Respiratory Assessment

The child's oxygenation status should be assessed in a well-lit room by assessing clinical signs and symptoms, and recording baseline observations. Temporary exposure of the child, including the head, thorax and abdomen is an essential part of respiratory assessment.

Assessment of child presenting with rapid or laboured breathing

- Increased work of breathing [tracheal tug/costal or sternal recession/ see-saw breathing] Effort mostly on inspiration or expiration
  - inspiration-upper airway obstruction likely
  - expiration-lower airway obstruction likely
- Causes of inspiratory obstruction
  - croup, foreign body aspiration, bacterial tracheitis, tonsillar abscess, epiglottitis and diphtheria (rare in the immunised child in Australia)
- Causes of expiratory obstruction
  - wheeze +/- crackles (asthma, bronchiolitis, lower respiratory tract infection, anaphylaxis, foreign body).
- Rapid breathing (without increased work of breathing)
  - anxiety, fever, pain, pneumonia, severe anaemia and metabolic acidosis, including starvation, sepsis, diabetic ketoacidosis, and salbutamol overdose, heart failure.

Management of the tachypnoeic or dyspnoeic child

- Hypoxia – treat with high flow inhaled O_2. It should be suspected particularly in the agitated, combative or 'naughty' child (particularly if out of character), and confirmed with oximetry or capillary blood gas (see below)
- Hypercapnoea may be increasingly recognised with the use of end-tidal CO_2 monitors, and treated with continuous positive airways pressure, for example in infants with a Neopuff®.
- Care should be taken to avoid over-extension or flexion of the child's neck to avoid increasing upper airways obstruction. Often the best position for a conscious child is sitting on a carer's lap, to try to minimise distress, and O_2 consumption.
- Wheezing will often respond to salbutamol in the child over the age of 12 months – see asthma guideline for dosage. Bronchodilators are less likely to be helpful before the first birthday, and may occasionally make matters worse.

Monitoring oxygen levels and oxygen delivery

- Oximetry probe of the correct size should be positioned appropriately and baseline observations recorded in room air.
- An oximetry reading > 94% in room air is desirable.
- Oximetry readings < 94% with or without clinical signs and symptoms of respiratory distress or hypoxia, indicate the need for supplementary oxygen in the acutely ill child.
- Not all children with increased oxygen requirements exhibit respiratory symptoms, e.g. the shocked child, drug overdoses, seizures, trauma and dehydration.
- All nebulised medication should be administered via wall or cylinder oxygen to maximise effectiveness, irrespective of the child's needs for continuous supplementary oxygen between medications.
- When receiving oxygen therapy the child should be continuously monitored by use of oximetry for 2 hours initially.

  A minimum of hourly spot oximetry readings should be attended in conjunction with hourly pulse, respirations and assessment of respiratory status, i.e. chest recession, tracheal tug, nasal flaring, arousal, activity level and level of consciousness.
- Full explanation should be given to both the child and carer regarding the importance of continuous monitoring and observation.

The shaded portions contained in the treatment guidelines should only be used by RNs who are recognised as Paediatric FLECC credentialed nurses

- Any increase in oxygen demands or deterioration in the child's condition should be reported to the Medical Officer immediately.

Symptoms	Mild	Moderate	Severe
Airway	Stridor on exertion	Stridor at rest Partial airway obstructed	New onset of stridor Imminent airway obstruction
Behaviour & feeding	Normal Talks in sentences	Some/intermittent irritability Difficulty talking or crying Difficulty feeding or eating	Agitated/confused Drowsy Unable to talk or cry Unable to feed or eat
Respiratory rate	Mildly increased	Respiratory rate in the yellow zone	Respiratory rate in the red zone Decreasing (exhaustion)
Use of accessory muscles	None/minimal	Moderate recession Tracheal tug Nasal flaring	Severe recession Gasping/grunting Extreme pallor Cyanosis Absent breath sounds
Oxygen requirement	No oxygen requirements	Mild hypoxaemia, corrected by oxygen Increasing oxygen requirements	Hypoxemia, may not be corrected with oxygen
Apnoeic episodes	None	Abnormal pauses in breathing	Apnoeic episodes

Reference

New South Wales. Clinical Excellence Commission 2015, *Paediatric Emergency Department Observation Charts*, NSW Health, Sydney.

Appendix Four: Glasgow Coma Scale and Modified Glasgow Coma Scale

Glasgow Coma Scale		Modified Glasgow Coma Scale (<5 yrs)	
Eye opening		Eye opening	
Spontaneously	4	Spontaneously	4
To speech	3	To speech	3
To pain	2	To pain	2
No response	1	No response	1
Best verbal response		Best verbal response	
Orientated and converses	5	Alert; babbles, coos, words to usual ability	5
Confused and converses	4	Less than usual words, spontaneous irritable cry	4
Inappropriate words	3	Cries only to pain	3
Incomprehensible sounds	2	Moans to pain	2
No response to pain	1	No response to pain	1
Best motor response		Best motor response	
Obeys verbal command	6	Spontaneously/obeys verbal command	6
Localises to pain	5	Localises to pain/withdraws to touch	5
Withdraws from pain	4	Withdraws from pain	4
Abnormal flexion to pain (decorticate)	3	Abnormal flexion to pain (decorticate)	3
Abnormal extension to pain (decerebrate)	2	Abnormal extension to pain (decerebrate)	2
No response to pain	1	No response to pain	1
Maximum score	15	*Maximum score*	15

Total = Eye opening + Best verbal response + Best motor response = 3 – 15 A GCS

Score < 9 requires urgent airway management.

A GCS Score <14 requires immediate medical attention.

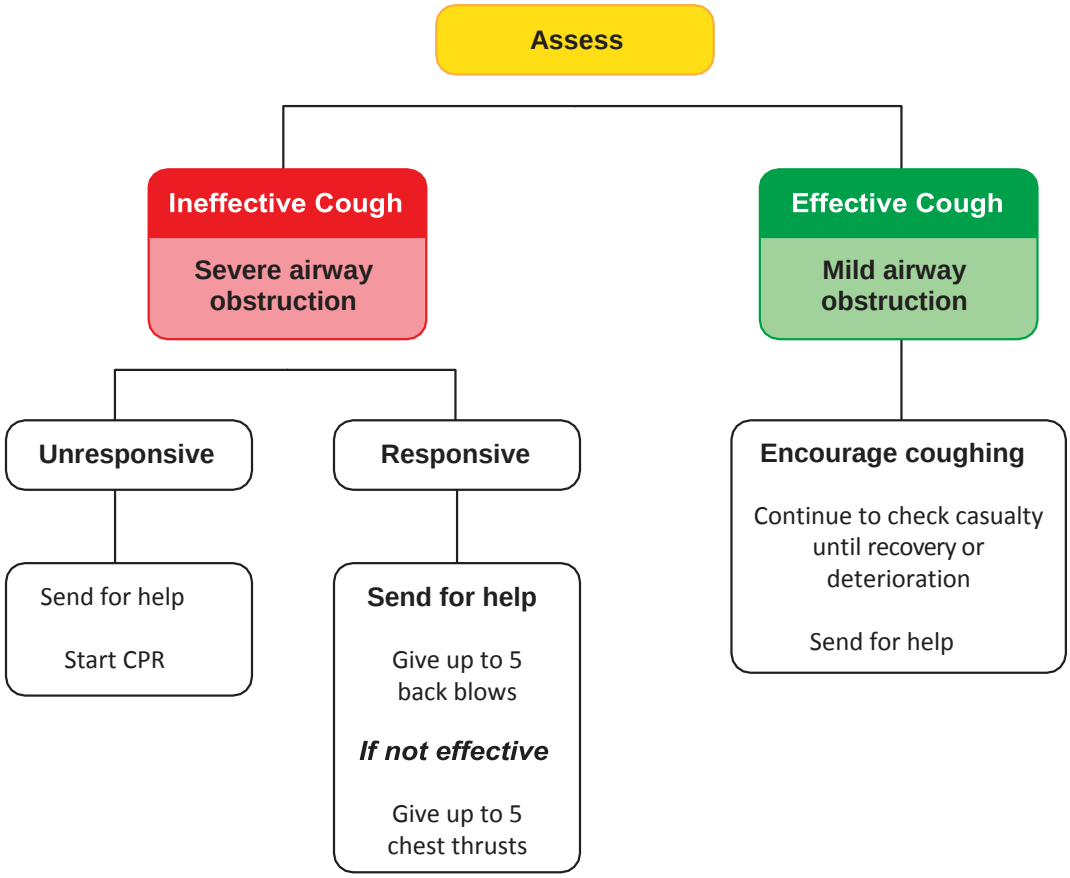
References

Advanced Life Support Group 2017, *Advanced paediatric life support: a practical approach to emergencies: Australia and New Zealand*, 6th edn, John Wiley and Sons, West Sussex.

New South Wales. Agency for Clinical Innovation 2011, *Infants and children: acute management of head injury*, NSW Health, Sydney.

Appendix Five: Choking Child Algorithm

Management of foreign body airway obstruction (choking) algorithm



Reference

Australian Resuscitation Council 2016, *ANZCOR Choking Flowchart (management of Foreign Body Airway Obstruction*, accessed 22 January 2020.

Appendix Six: Primary and Secondary Survey

This is a systematic approach used for patient assessment and treatment when the patient has life-threatening conditions or injuries. The Primary/Secondary Survey emphasises the importance of prioritising and instigating the correct sequence of care.

Note

- Infants and young children are prone to hypothermia.
- Although it is important to expose children for assessment, it is necessary to provide external heating like warm blankets/towels or overhead heating during thisprocedure.
- Hypothermia in the infant and young child can hasten or lead to more serious illness.

The Primary Survey consists of a rapid patient assessment and treatment of any immediately life- threatening conditions.

This will involve simultaneous assessment and treatment of the following:

- airway with cervical spine control
- breathing and ventilation
- circulation and haemorrhage control
- disability – neurological
- exposure (undress the patient).

Secondary Survey is a systematic assessment of the patient from head to toe, so that each body system is reviewed. It includes patient history and commencement of relevant investigations. Using a systematic approach:

- head and face
- neck
- chest
- abdomen
- pelvis and genitalia
- upper and lower limbs
- back
- vital signs
- history – Including mechanism of injury past and present medical history and relevant family history
- investigations
- documentation.

Throughout the Secondary Survey the patient requires continuous monitoring and assessment, if there is any deterioration, the Primary Survey should be repeated.

Appendix Seven: Snakebite Observation Chart

Management guidelines for snakebite and spiderbite in NSW

Snakebite observation chart

Patient Surname: Date of bite:
First name: Time of bite:
Date of birth: Type of snake:
MRN Number: Number of bites:

Date:												
Time:												
Time after bite:												
GENERAL:												
Pulse rate:												
Blood pressure:												
Temperature:												
SPECIFIC:												
Regional lymph node tenderness:												
Local bite site pain:												
Bite site swelling:												
Headache:												
Nausea:												
Vomiting:												
Abdominal pain:												
PARALYTIC SIGNS: Ptosis:												
Opthalmoplegia:												
Fixed dilated pupils:												
Dysarthria:												
Dysphalgia:												
Tongue protrusion:												
Limb weakness:												
Respiratory weakness:												
Peak flow rate:												
MYOLYTIC SIGNS:												
Muscle pain:												
Myoglobinuria:												
COAGULOPATHY SIGNS:												
Persistant blood ooze:												
Haematuria:												
Active bleeding:												
RENAL:												
Urine output:												
LABORATORY KEY TESTS:												
INR/prothrombin time												
aPTT												
Fibrinogen												
XDP/FDP												
Platelet count												
CK												
Creatinine												
Urea												
K+												
ANTIVENOM:												
Type/amount/time:												
Reaction												

Reference

New South Wales. Agency for Clinical Innovation 2014, *GL2014_005 Snakebite and Spiderbite Clinical Management Guidelines 2013, 3rd edn*, NSW Health, Sydney. This guideline was under review at time of publication.

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Appendix Eight: Paediatric Pain Assessment

Effective pain management in the paediatric patient begins with an accurate, developmentally appropriate assessment of pain. This includes parent and/or child self-reports (e.g. pain ladder, faces scales) and the assessment of behaviour e.g. crying, whimpering, lack of interest in play and surroundings, irritability, general activity and physical parameters e.g. tachycardia, tachypnoea, sweating.

It is desirable that infants and children are not separated from their parents or primary care giver during clinical assessment or whilst undergoing invasive procedures such as IV cannulation, NG tube insertion.

Remember to incorporate supportive and distractive techniques into all pain management strategies.

These include utilising games, puzzles, familiar toys, music, video/TV viewing, reading, cuddling, support from parents and pacifiers (dummies, security object, etc.).

The following list indicates behaviours that would prompt you to undertake a more formal pain assessment:

- limited movement
- distressed/irritable/grimacing
- obvious deformity
- guarding or posturing
- inconsolable.

The age and development of the infant or child will influence how they might behave when in pain. The following table provides a guide to age related pain behaviours.

Age	Behaviours	
Infants	Young infant – rigid, thrashing, reflex withdrawal Older infant – physical resistance Irritable stimuli/response	Loud cry Facial expression Knees drawn to chest
Young child	Scream/cry Thrashing Uncooperative (need restraining) Restless/irritable	Cling to parent Seek comfort
School age	As previous plus Stalling behaviours 'wait until', 'in a minute' Clenched fist Closed eyes, frown	Muscle rigidity Gritted teeth
Adolescent	Less vocal protest More verbal communication – 'it hurts' Body control	Less motor activity Increased muscle tension

Assessment and reassessment of pain should be made to determine the ongoing effect of analgesia. Frequency of reassessment is determined by the severity of the pain, patient needs and response, and the medication used. Reassessment should also consider the potential adverse effects of analgesia.

Table 1: Pain Assessment Tools

SCALE	TARGET GROUP
Neonatal Infant Pain Scale (NIPS)	Less than 2 months
Face, Legs, Activity, Cry, Consolability (FLACC)	Between 2 months to 7 years
Faces Pain Scale (FPS-R)	Over 4 years
Linear Scale (visual analogue scale)	Over 7 years
Revised FLACC (r-FLACC)	Children with cognitive impairment

Source: New South Wales. Agency for Clinical Innovation, 2018.

Neonatal Infant Pain Scale (NIPS)

The NIPS is a reliable, valid, easy to use tool for assessing pain in neonates and infants under two months old. The NIPS is a six item (0-2 point) pain assessment scale, with a total score of 0-7. The parameters tested are facial expression, cry, breathing, patterns, position of arms, position of legs and state of arousal.

Assessment	Score = 0	Score = 1	Score = 2
Facial expression	Relaxed muscles (Restful face, neutral expression)	Grimace (Tight facial muscles, furrowed brow, chin, jaw)	
Cry	No cry (Quiet, not crying)	Whimper (Mild moaning, intermittent)	Vigorous cry (Loud scream; rising, shrill, continuous)
Breathing patterns	Relaxed (usual pattern for this infant)	Change in breathing (In-drawing, irregular, faster than usual, gagging, breath holding)	
Arms	Relaxed/restrained (No muscular rigidity; occasional random movements of arms)	Flexed/extended (Tense, straight legs; rigid and/or rapid extension, flexion)	
Legs	Relaxed/restrained (No muscular rigidity; occasional random leg movement)	Flexed/extended (Tense, straight legs; rigid and/or rapid extension, flexion)	
Arousal	Sleeping/awake (Quiet peaceful sleeping or alert random leg movement)	Fussy (Alert, restless and thrashing)	
NIPS interpretation – add the scores from each of the 6 assessments for a score of 0 – 7 0 = No pain 1-2 = Mild pain 3-4 = Moderate pain 5- 7 = Severe pain			

Source: Lawrence, Alcock, McGrath, Kay, MacMurray and Dulberg 1993.

Faces, Legs, Activity, Cry, Consolability FLACC Behavioural Pain Assessment Scale (3 months – 4 years)

The FLACC Scale is a behavioural scale for scoring pain in children between the ages of 3 months and 7 years of age. The FLACC scale is suitable for children with Culturally and Linguistically Diverse (CALD) backgrounds.

Each of the 5 categories (faces, legs, activity, cry, and consolability) is scored from 0 to 2 and the scores are added to get a total score from 0 to 10. Behavioural pain scores need to be used within the context of the child's psychological status, anxiety and other environmental factors.

	Score = 0	Score = 1	Score = 2
Face	No particular expression or smile	Occasional grimace/frown withdrawn or disinterested, appears sad or worried	Frequent to constant frown, clenched jaw, quivering chin, distressed looking face: expression of fright or panic
Legs	Normal position or relaxed	Uneasy, restless, tense, occasional tremors	Kicking, legs drawn up, marked increase in spasticity, constant tremors or jerking
Activity	Lying quietly, normal position, moves easily	Squirming Shifting back/forth/tense, mildly agitated (e.g. head back and forth, aggression), shallow splinting respirations, intermittent sighs	Arched, rigid or jerking, severe agitation, head banging, shivering (not rigors), breath-holding, gasping or sharp intake of breath, severe splinting
Cry	No cry (awake or asleep)	Moans or whimpers, occasional complaints, occasional verbal outburst or grunt	Crying steadily, screams or sobs, frequent complaints, repeated outbursts, constant grunting
Consolability	Content, relaxed	Reassured by occasional touching, hugging or talking to, distractible	Difficult to console or comfort, pushing away caregiver, resisting care or comfort measures
FLACC interpretation – add the scores from each of the five assessments for a score of 0-10			

Source: Merkel, Voepel-Lewis and Malviya 2002.

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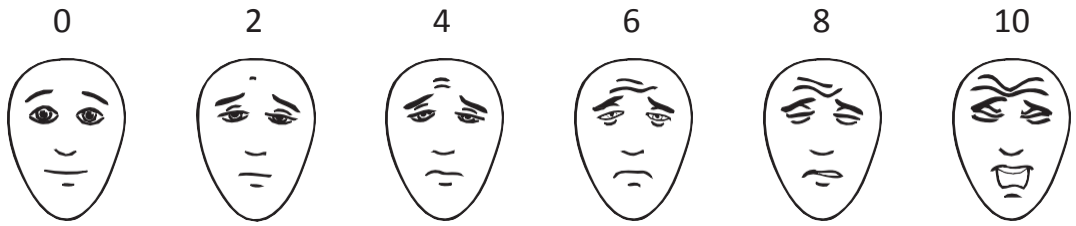
Faces Rating Scale (FRS)

For children ≥ 4 years old. These scales work well for people with a culturally or linguistically diverse background (CALD).

Instructions to the child: 'These faces show how much something can hurt. From no pain (indicate face on the left), the faces show more and more pain, to the face that shows very much pain (indicate the face on the right). Point to the face that shows how much youhurt'.

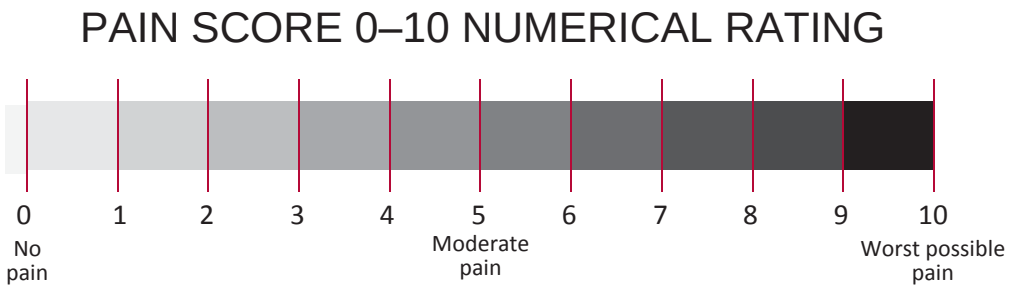
Scoring: Score the selected face 0, 2, 4, 6, 8 or 10 counting from left to right. The scale is intended to measure how patients feel inside, not how their facelooks.



Source: International Association for the Study of Pain 2001.

Numerical Rating Score (NRS)

This may be used for adults and for children aged 6 to 8 years. Instruct the patient to rate their pain intensity on a scale of 0 ('no pain') to 10 ('the worst pain imaginable'). The patient can respond either verbally or by pointing on the scale.

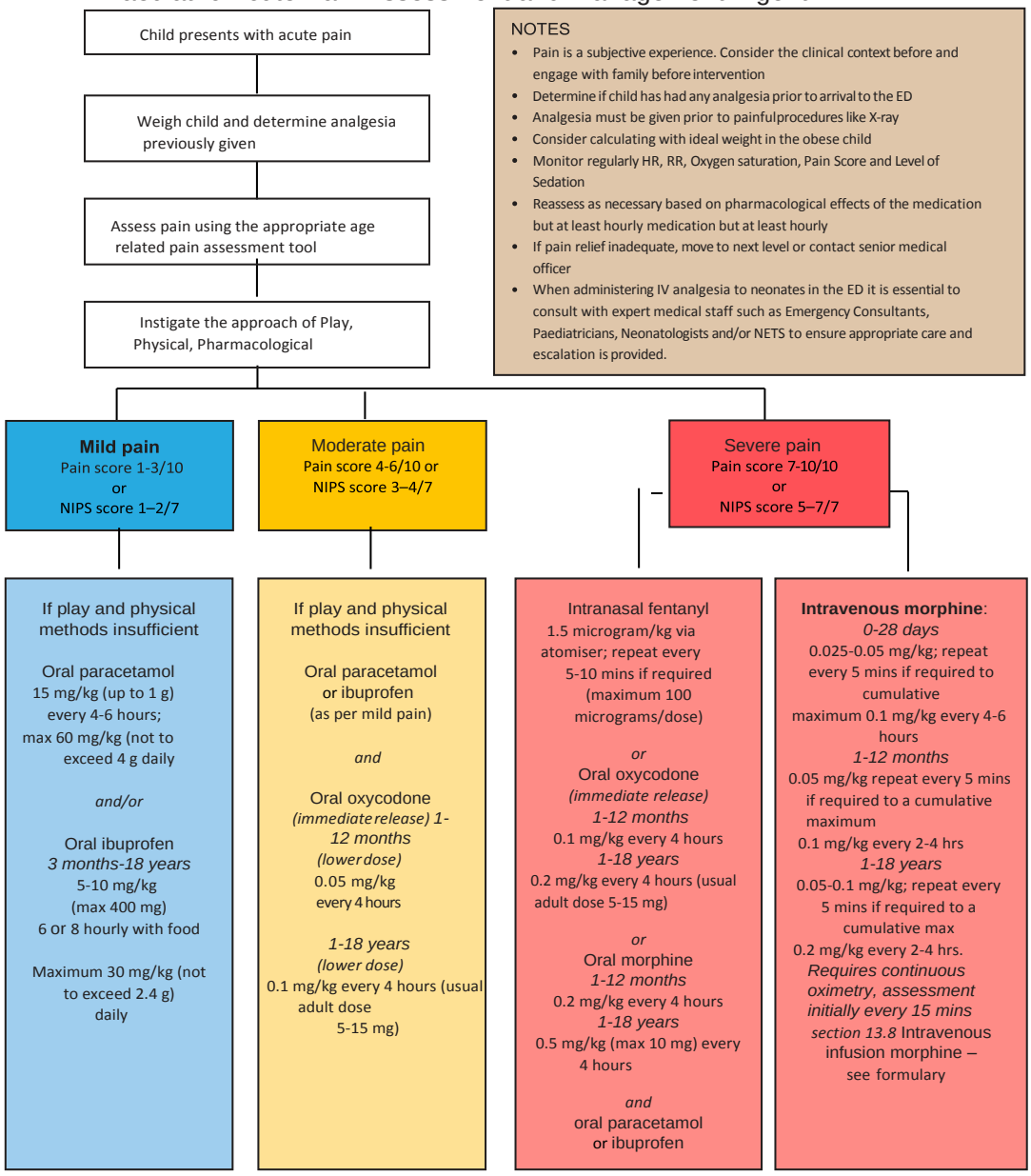


Source: Scott and McDonald 2008.

Pain level definitions

	Pain Tool	Mild Pain	Moderate Pain	Severe Pain
NEONATAL	NIPS	1-2/7	3-4/7	5-7/7
PAEDIATRIC	FLACC/r-FLACC Faces – Revised	1-3/10	4-6/10	7-10/10

Paediatric Acute Pain Assessment and Management Algorithm



Source: National Institute of Clinical Studies 2011.

References:

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Appendix Nine: Head Injury Risk Categories

	LOW RISK	INTERMEDIATE RISK	HIGH RISK *CHALICE criteria (any feature)
HISTORY			
Witnessed loss of consciousness	nil	< 5 minutes	≥ 5 minutes
Anterograde or retrograde amnesia	nil	possible	≥ 5 minutes
Behaviour	normal	mild agitation or altered behaviour	abnormal drowsiness
Episode of vomiting without other cause	nil or 1	2 or persistent nausea	3 or more
Seizure in non-epileptic patient	nil	impact only	yes
NAI suspected	no	no	yes
Headache	nil	persistent	persistent
Co morbidities	nil	present	present
Age	≥ 1 year	< 1 year	any
MECHANISM			
Motor Vehicle Accident (MVA) (pedestrian, cyclist or occupant)	low speed	< 60 km/ph	≥ 60 km/ph
Fall	< 1 metre	1-3 metres	≥ 3 metres
Other	low impact	moderate impact or unclear	high speed projectile or object
EXAMINATION			
GCS	15	fluctuating14-15	< 14 or < 15 if under 1 year old
Focal neurological abnormality	nil	nil	present
Injury			*high risk features (see below)

Source: New South Wales. Agency for Clinical Innovation 2011.

High risk injury:

a. penetrating injury, or suspected depressed skull fracture or base of skull fracture.

b. scalp bruise, swelling or laceration ≥ 5 cm, or tense fontanelle in infants < 1 year of age.

*High risk adapted from the Archives of Disease in Childhood 2006, children's head injury algorithm for the prediction of important clinical events (CHALICE) study group, Derivation of the children's head injury algorithm for rule for head injury in children the prediction of important clinical events.

Note:

Children < 1 year

- require greater vigilance due to difficulty in clinical assessment and greater risk of abusive head injury (Non accidental injury)
- a high index of suspicion for intracranial injury must exist for these patients, if no other intermediate risk factors present may be managed as low risk after consultation with paediatric experts.

Inflicted head injury

- If inflicted head injury is suspected consult with paediatric referral hospital to discuss the indicators of the case.
- If inflicted head injury is agreed child should be transferred to a paediatric tertiary referral centre.
- Notify via the Mandatory Reporter Guide.

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Management

Low risk

- may be discharged after medical review if have responsible carers
- must be able to return easily to the hospital in case of deterioration.

Intermediate risk

- admission and observation required for 4-6 hours post injury
- GCS must be sustained at 15 for 2 hours
- CT indicated if acute deterioration or persisting symptoms at 6 hours post injury
- may be discharged at conclusion of observation period if GCS 15, asymptomatic child has responsible carers and a normal CT (if performed)
- children who fail these categories should be discussed with a paediatric expert or neurosurgical unit.

High risk

- urgent CT
- transfer/retrieval
- *if unable to be performed should have observation for a minimum period of 24 hours.

Severe head injury – GCS < 9

- Trauma call +/- retrieval to nearest paediatric referral centre.

Note:

Given the issues of distance and dislocation for families if a child requires transfer to a larger centre, the benefits of a CT scan have to be weighed against the risk of delay of diagnosis resulting from an 'observation only' policy. All high risk patient who cannot have immediate CT scanning should at a minimum, have prolonged observation in hospital for at least 24 hours and until clinically improved.

Identification of Acute Deterioration

- a drop of one point in the GCS for at least 30 minutes (greater weight should be given to a drop in the motor score of the GCS)
- a drop of > two points in the GCS regardless of duration or GCS sub-scale
- development of severe or increasing headache or persistent vomiting
- development of agitation or abnormal behaviour
- clinical signs suggestive of seizure activity
- clinical signs consistent with coning or unilateral/ bilateral pupillary deterioration
- Cushing's triad: hypertension, bradycardia and irregular respirations
- extensor posturing or hemiparesis
- pupillary signs: sluggish reaction or unilateral/ bilateral pupil dilation.

Note:

The younger the child, the more non-specific the clinical signs of elevated intracranial pressure.

Reference

New South Wales. Agency for Clinical Innovation 2011, *Infants and children: acute management of head injury*, NSW Health, Sydney.

Appendix Ten: Sedation Score

Evidence indicates that a decrease in respiratory rate is a late and unreliable indicator of respiratory depression following opioid administration. Sedation has been found to be a reliable early clinical indicator of respiratory depression and should be monitored following opioid administration using a sedation score.

Maximum sedation score achieved during sedation period (University of Michigan Sedation Score (UMSS)

- 0= Awake and alert
- 1= Minimally sedated: may appear somnolent/sleepy, responds to verbal conversation and/or sound
- 2= Moderately sedated: somnolent/sleeping, easily roused with light tactile stimulation or simple verbal command
- 3= Deep sedation: deep sleep, rousable only with deep or significant physical stimulation
- 4= Unrousable

The patient is scored according to the scale above.

The aim is to keep the sedation score below 2 regardless of the route of opioid administration. A sedation score of 2 means that the patient is constantly drowsy or groggy but still easy to rouse – e.g. they wake up easily but cannot stay awake during conversation.

Evidence indicates that a decrease in respiratory rate is a late and unreliable indicator of respiratory depression following opioid administration. Sedation has been found to be a reliable early clinical indicator of respiratory depression and should be monitored following opioid administration using a sedation score.

References

Malviya, S, Voepel-Lewis, T, Tait, A. R, Merkel, S, Tremper, K & Naughton N 2002, 'Depth of sedation in children undergoing computed tomography: validity and reliability of the University of Michigan Sedation Scale (UMSS)', *British Journal of Anaesthesia*, vol. 88, no.2, pp. 241-245.

New South Wales. Agency for Clinical Innovation 2018, *Paediatric procedural sedation: guide for emergency department, wards, clinics and Imaging*, NSW Health, Sydney.

Appendix Eleven: Paediatric IV Fluids Standard (2nd Edition)

IV FLUID CONTENT

FOR CHLDREN (excluding neonates)

Specialist consultation recommended when prescribing for infants < 3 months neonatal fluids may be more appropriate.

For Resuscitation / Bolus

- 0.9% sodium chloride

Alternatively and ONLY under direction of Specialist:

- other crystalloids, e.g. balanced salt solutions, or colloids may be used.

For Replacement Fluids (dehydration or ongoing losses)

- 0.9% sodium chloride + 5% glucose +/- potassium chloride20mmol/L

Alternatively and ONLY under direction of Specialist:

- Plasma-Lyte148 + 5% glucose

If electrolytes are outside the normal range, discussion with a specialist is necessary

IV FLUID CONTENT

FOR NEONATES (less than one month of age corrected)

For neonates in neonatal nurseries (excluding neonatal intensive care), or presenting to emergency departments, or admitted to paediatric wards.

For Resuscitation / Bolus

- 0.9% sodium chloride

For Fluids (dehydration or ongoing losses) or Maintenance

Special Care Nurseries – DAY 1

- 10% glucose

Special Care Nurseries – DAY 2 onwards

- 0.225% sodium chloride + 10% glucose +/- potassium chloride 10mmol/500mL

Emergency Departments

- 0.45% sodium chloride + 10% glucose (NO potassium chloride)

Paediatric Wards

- 0.45% sodium chloride + 10% glucose +/- potassium chloride 10mmol/500mL

If electrolytes are outside the normal range, discussion with a specialist is necessary

Reference

New South Wales. NSW Health 2015, *Standards for Paediatric Intravenous Fluids, 2nd edn*, NSW Health, Sydney.

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